

AVIATION

The Oldest American Aeronautical Magazine

MAY 2, 1927

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A Naval Vought UO leaving the U.S.S. Maryland by catapult

VOLUME
XXII

SPECIAL FEATURES

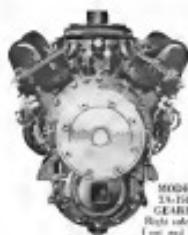
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AVIATION IN SOUTH AMERICA
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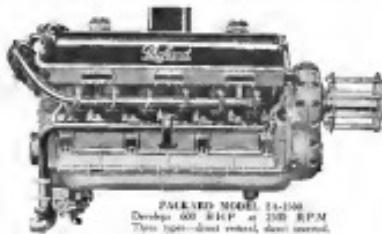
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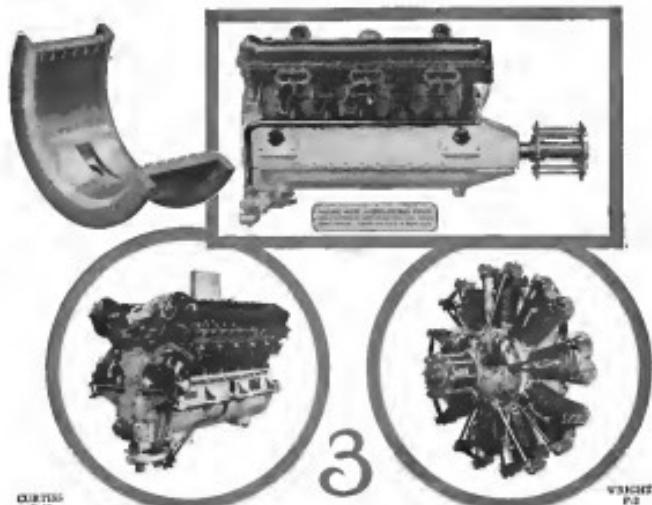
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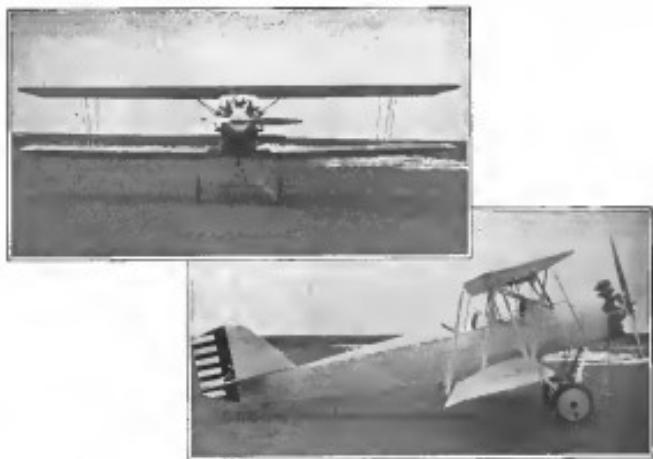


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With the Editor

To be literally with the editor this week is to be part and parcel of the All-American Aircraft Display, Washington, D. C., May 2 to 6. Weeks before the actual opening of the Display, this was where the editor really was on thought, and throughout the Show he will be there either in service or in spirit. For he feels that the importance of this project cannot be overemphasized. Running parallel, as it does, with the International Aeroplane Show, it should bring to the attention of our North and Central American neighbors the wisdom of the establishment of air routes between the two continents, the gradual expansion of experimental aviation facilities, and above all, show to American interests the strides made for the last few years in the manufacture of aircraft and their application to the needs of urban and suburban life, in carriers of mail, freight, passengers and in the pursuit of pleasure and in commerce.

A portion of the program outlined for the day-to-day Display creates the impression that even the most optimistic enthusiast will view modern aircraft expansion with surprise.

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Competitive Bidding for Air Mail Contracts

THIS NECESSITY for letting government contracts out through a system of public competitive bidding has, unfortunately, proved impracticable as a result of long experience, and, apparently, there is no other method which will convince the public that no malfeasance or favoritism is being shown in the allocation of contracts. In many cases the Government, in its purchase of the supplies, is forced to buy the cheapest goods, irrespective of quality, but in other cases such detailed specifications are drawn up that only one particular brand will fit the bill. An absolutely infallible system of letting contracts to the lowest bidder would not be possible, and in practice certain slight variations from the strict letter of the law have become common practice, though in a sense of duty the law may be rigidly enforced. Under certain circumstances, such as the carrying of mail by railroads and steamships, Congress has required that service be more important than cheapness and has passed special laws to take care of the

The Kelly Bill, providing for the contract air mail, naturally conformed to the general provision as made to competitive bidding, but it is doubtful whether the framers of the law ever foresaw the conditions which have now arisen. For example, the sender of a letter from New York to Chicago by air will pay ten cents for each half ounce and, as at the latter average somewhat underwriting the Post Office receives in the neighborhood of four dollars for every pound of mail, while the successful bidder on this route receives only one dollar and twenty five cents or less than one-third of what the public is paying for the service.

The Post Office naturally, has delivery expenses and where letters go beyond Chicago they must pay the other contractor his share, but even taking this into account the Post Office seems to be receiving too large a proportion of the revenue, under a bill which was primarily enacted to foster commercial activity.

The contractors presumably know their business in making their bids and should not, therefore, lose money, but the real question to be decided is whether or not the public is to be called on to pay the Government a great deal more extra postage on air mail than the contractor is receiving from the Government. There is no doubt that operations will gradually build up a volume of business which will eventually result in making the bidding for the contracts extremely competitive. This brings down the amount which the successful contractor receives, though not lessening the price which the public pays.

This matter is extremely important and all probability will require Congressional action. These acts will be advisory; they, a species of allocation of contracts such as is now used with armaments and railroad rates, and the object, a decrease in the sum paid rates to a greater volume of mail can be insured. It is certain that if the present competitive bidding system in all contracts is carried to the logical conclusion of barefooted competition, the public will pay high rates as at present, the competitor will not receive sufficient money, and the Government will not receive up a healthy commercial nation in return.

Trans-Atlantic Hazards

TITLE CHASE of the Solenoid trans-Atlantic plane and its disappearance of the Pukaré plane and destruction of Commander Daryl American Legion made ends even those who believe that all planes are usually made by Americans, to question the preparatory methods now used for long distance flights. The following achievement of the guest bar across the Atlantic is good proof that it may be necessary now again a massing of what is a prudent line from the unorganized engineering standpoint. The duration flight of the Belknap and Atlanta plane demonstrated its possibilities in any sensible manner. If any rushing had been done during the flight, a landing ground was usually to provide emergency. But when planes are given courses that cause them to come to disaster while taking off, either the engineering computations must be at fault or the speed of the aircraft is placed on the flying qualities of the plane. An aircraft is best suited to fly under normal conditions; the more dangerous, the less well it will fly. Similarly to the overextended condition of aircraft that are expected to break distance and duration records. Before any accidents occur it would appear to be the wise course to place the responsibility for the surviving of many kinds of fads on the designer and in case of disaster to know who is blame-worthy.

Commercial aviation will not progress by creating an atmosphere in the mind of the public that the people providing planes do not know what they are doing, especially in the case when accident after accident occurs in our flights. If the persons who are attempting this valuable flight would realize that their objective is not only to make the goal but to encourage aeronautical confidence, much of the distrust that are taken might be ended. To sacrifice the lives of brave and experienced fliers in experimenting with hardware loads is paying too great a penalty for the additional progress the non-stop New York-Pearl flight will demonstrate.

Greece at this time, it is a generally accepted fact that in the early days of its operations, the airline up the Magdalena River in Colombia, operated by the "Santana" company had their origin in German interests. The Argentine has also seen in, for the efficiency of German operators in the past although the air operations up and down the River Plate have not, to be sure, been very continuous, or extensive.

French Cooperation

As far as French interests in South America are concerned, it will be remembered that some years ago a French mission headed by Capt. Ernest Faucon visited South America, demonstrating French aircraft and stimulating local interest in French commercial products and French methods. Some years ago, also, an airline was operated by French interests in French Guiana, although those operations did not really continue very long before they were discontinued. Furthermore, the French have had, and now have, a project, which may be described as follows: during the present year, for the expansion of an air line between Brazil, in French West Africa, and Fernando de Noronha, the capital of the Argentine.

In the meantime, the United States, while not remaining entirely indifferent to the possibilities of the development of air routes in South America, has not, to date, given the adequate and whole-hearted consideration. A number of companies, however, are engaged in United States activities in the Latin American, which have proved of major importance in their individual ways, while in Central America, United States activity, here, in the way, has very much. It should, while there is a field of such with that no former attack upon the Latin American market can justify so needlessly in turn many other leaders, nevertheless, it is necessary to point out that United States American Airlines, Inc., has already done in the southern regions, his share of permanent importance in laying the foundations upon which future activity is based to grow.

In Central America, however, there appears to be a very real and, can might say, immediate field for the development of still further for the nature of the terrain is such that, especially along the Pacific coast, flying probably gives many greater advantages than ground transportation. It is not unlikely that a definite market may grow up in a small number of places or four-line open cockpit or closed cabin type of monoplane with a low horsepower engine, is other words, a more or less popular press machine suitable for private or small company ownership. American aircraft are, no doubt, in these regions between Tucuman and the Chaco, Bolivia, and the world, but the All American, mentioned earlier, from Puerto Rico, which is right at that district, most undoubtedly have had his effect upon certain of the Central American peoples.

With little doubt one of the best methods of influencing the possibilities of the development of aviation in Central and South America is to set forth in an concise manner a possible list of projects which have already been made with a view to pointing out the lines along which the project can actually have, at least, and the results which can reasonably be expected. These lines of possibility which have not yet been summed up. It is proposed to succeed faithfully with such a discussion under the headings of the different countries or republics concerned. In such case the summary of the land will have an important bearing upon aeronautical development and will, therefore, be dealt in brief.

Argentina

The Argentine, as the most logical Republic of South America, presents considerable for the development of aviation. With the exception of the mountainous Andes which stretch down the western border, the land consists of great plains, and forest areas on which routes and cities very familiar together with cattle frontier abound, suggesting immediately the possibilities of the use of aircraft in the re-



Two Potez as seen from the air. The photograph was taken by Capt. de Sotero over the Andes.

construction of aerial services at present developed. Most of the land is dependent in some way upon the Capital, Buenos Aires, and yet, as yet, no system of railway services which satisfies a wide area of our transportation is in immediate possibility. Presently all the passenger development is said to have been carried out by British interests although French and Italian interests have been active for several years. It is the German Junkers company, which, however, appears to have gained the greatest cooperation from the Argentine government, with the result that of the two big engines now in use, the Hispano-Suiza 12B and the Argus 10C, the latter is the Southern Motor Company which the Buenos Aires Motorcycles service these lines mostly. The older engine, was the Alfa Lloyd of Carlisle, which operated the service from Villa Dolores via Cordoba to La Plata, the three times per week although this latter service was by no means regular. The Junkers engine is said to be imported by Argentine appeal. The machine engine, which is imported from Scotland are Junkers engines, 185 h.p. H.P. W. engine. The latter requires less fuel, the way flight is slightly less than two hours. The operators hold a fixed carrying contract with the governments of the Argentine and Uruguay. In addition, each plane carries four passengers at a charge of approximately \$20.00 per passenger for the single way trip.

The Villa Dolores service is unoperated, being operated by the Aeroparque, which is a small local company. It is understood that the government of the Argentine is carrying out experiments with new airplane in preparing instructions to combat the severe frost plague in the Province of San Luis. If this work is successful, the use of planes in flight work as return to develop.

It is reported that to date Argentina has no legislation governing or encouraging civil aviation, although one or two projects for the setting up of a national airline in the Andes, G. C. A. The only restriction on aviation at the present time is that preventing planes from Syria in Argentina without first securing permission from the Ministry of Foreign Affairs. Commercial aviation in the country is under the supervision of the Department of Civil Aviation of the Armament Service of the Army.

It will be recalled that in 1929 it was reported that both the Army and the Navy of the Argentine had made purchases of aircraft to a total value of approximately twenty planes in the United States.

Bolivia

A large portion of the Republic of Bolivia, the most sparsely populated of all South American Republics, is desert land, particularly in the south while the people of the north, which is more inhabited, devote their time to either growing and timber felling. Interest in aeronautics is very de-

lative, there being only three railroads of a total mileage of 1,500 miles.

Aeronautic activity in Bolivia in the past have not been very extensive although the possibilities are said to be considerable. The only service operated to date is the Linea Aeroposta Boliviana, the Douglas, the Douglas, the Douglas and Douglas. The equipment on this service consists of two Junkers airplanes capable of carrying passengers and mail. The trip by air takes from two to two-and-a-half hours compared to the only other method of transportation—mail boats—requiring from ten to twelve days.

Present plans for the future development of air transportation are under consideration. A committee in the Spanish language has been appointed in a small town to the Chamber of Deputies of the Bolivian Congress by the Department of Posts, for a mail and passenger service in Eastern Bolivia, between Santa Cruz, San Jose de Chiquitos, Robres, and Puerto Suarez. New landing fields are to be built in El Triunfo at Misque, San Isidro, El Poco, Puerto Grande and Tarija.

Brazil

Brazil occupies more than one half of the entire South American Continent. From north to south the various mountains of high terrain, in 8,000 feet, from the coast to the interior, are nearly of the same order of the coast, in high plateaus with a general elevation of from 1,000 ft. to 3,000 ft. and much of the present industrial transportation is carried on by water along the Amazon, the Parana and the Paraná Rivers. The railway system is reasonably good with a total mileage of about 35,000 miles connecting with the systems of neighboring republics. The chief industry of the country is agriculture, with cotton, tobacco, coffee being raised, while both the forest and mines of Brazil are of great importance. There, there is considerable industrial development for the development of both air transportation is speeded up travel and aerial services.

Several has already been made of the plan of the Leducer company of France to operate a plane and boat service between Belém, in Africa, and Fernando de Noronha, a proposal which shows reasonable signs of taking measure form during the present year. In Brazil an air line between Manaus and Belém has been authorized by the State of Amazonas. The



AIRLINE SERVICE AS IT IS CARRIED OUT IN THE UNITED STATES. Ocean landing place of the Southern Cross Liner, Tahiti, La.

coastal has already been started, it is reported, and the line is expected to be in operation in the near future.

It is understood further that plans are already in existence for the operation of an air line in the Amazon do that. This is to be operated from Puerto Alegre to Belém and Rio Grande, Puerto Alegre, Santos, Santos, Puerto Alegre to Puerto Belém and others along the coast.

It is understood that there is a neutral meteorological office in Rio de Janeiro which has far-reaching information on aeronautical conditions over Brazil. Included in the general system are many stations which make up an aeronautical network.

A letter recently received by the Argentine Aircraft Corporation of Brazil, from Orson W. Rogers, chief of the São Paulo office, indicates that the present political situation which may seem to indicate to some measure the possibility of development in Brazil, at least as regards air traffic of the general problem. Furthermore, it seems to indicate that some products of the Argentine Aircraft Industry have already arrived in Brazil, a fact which, while being by no means unknown, can be established in part by the present instance. The letter follows in extenso:

RIO DE JANEIRO, March 25, 1937

"I have done about 3,000 miles and 100 hours in the aircraft we have now, and about 5000 of 6000 up through the interior of Brazil where we find a lot of very bad roads and to date we have not had to change a single tire of the machine. I do not think I have ever found a machine that is so easy to get into and out of small fields. Unfortunately, the Wright Whirlwind engine, too, has been functioning perfectly. The only solution to the difficulties of driving in Brazil is to buy a car. In order to do this I must drive and sometimes walk about one or two hours and usually about a day's time, a distance which takes by existing means of transport, over five days of endurance traveling. About 1,200 km. We were almost five hundred miles beyond the end of the railroad line the location of the State of Guyana. At one time I just a few miles from the center of the Amazon district of Brazil. One of my pet ambitions is to be able to run an airplane line from the city of São Paulo up to this district. The road and mountains

would almost pay even with the country as undeveloped as it is at present. It is only an eight to nine hour flight, whereas it now takes eight days by train, food and mule pack.

"Unfortunately my time up there was very limited and was also taken up with other things so that I was unable to go to all the places I wanted to visit or do the things I would like to have done. It was a military expedition undertaken by the Rio Dulce State Military Air Service, which took up most of the time available to me. I did however manage to make a few trips outside this expedition and I went along as technical adviser. The Kapetanios Petrol was the only supplier where came back. I myself crossed another place when I was forced to land part after crossing the Paracatupan River, which forms the border between the States of Gómez and Manu Gómez. I landed in the jungle about five miles from the railroad and as it was early in the morning I had no idea where I was. I waited for the sun to rise and then made my way to the nearest railway station. We tried to take two Jeeps as also. Our JF reached the town of Pomoná in the State of Gómez but reached the following day owing to the small field. The gift of this place was Lieutenant Negro who has had to leave Yucatán Verde to be second pilot on the "Jaquet," the flying boat which tried to fly from Yucatán to Brazil last fall."

Chile

Chile, with a coast line 2,200 miles in length, yet the entire interior is so great more than 900 miles as width, presents an unusual problem. From every standpoint, agricultural or otherwise. There are 200,000 miles of public highway and the Longitudinal Highway of Chile passes through the country north to south over a track distance of 2,000 miles, and it would appear that these provide for the major transportation needs of the country. There is undoubtedly, however, a considerable amount of coastal traffic and much of that that is an express service might well be speeded up with airplane service. Just the extent of the possibilities appears now to be having to do with economy, however, though the Chilean government has by no means ruled out the possibility.

Military aviation is under the Directorio General of Military Aeronautics, while there is also a Branches of Naval Aeronautics. It has been reported that there are some three-engine Junkers machines in the military service.

Colombia

Colombia was the first of the Latin American republics to develop commercial aviation and the operations of the

Bundes, to which reference has already been made, were established. The country is tremendously rich in mineral products, notably silver, mica and rubber, and industry is large, yet constantly hampered by lack of transportation facilities. Colombia cannot be said to possess a railroad system. The few railroads are detailed from connecting important towns with the sea or the Magdalena River, which is the main artery of traffic, even though this river is closed to traffic under at certain times of the year because of inundation of the banks. It is hard to imagine the value of this area.

In an interesting disclosure, last the Sociedad Colombiana de Transportes Aéreos, which operates a line of mailups on the Magdalena from Barrancabermeja to Guadalupe, 687 miles, Guatavita, 34 miles, and Steinberg-Cerroga, 55 miles should have proved a financial success. In 1936 the Bundes operated an aircraft consisting of five engine Juaders pushed propellers, with 180 hp. BMW IV engines, each with a seating capacity of four passengers in two rows of two, plus a baggage compartment of 6 ft. 8 in. by 4 ft. 9 in. This aircraft had a seating capacity of five passengers and a baggage compartment of five passengers; one Dornier Morane pusher monoplane, single BMW VI 214 hp engine, with seating capacity for six passengers in a closed cabin, two Dornier Wals flying boats with two BMW VI engines of 480 hp. each and having a seating capacity of six passengers in a closed cabin.

The Bundes has formed three associated companies known respectively as the Aeroparque, the International Aeroparque, and the Compañía Sideral de Aviación. The former undertakes experimental air transport operations. The latter has been active in planning and carrying out air surveys which appear to have a wide scope in Colombia, while the third is responsible for the execution, in behalf of the Bundes, of the Sistema de Transporte Aéreo Nacional.

Reconnaissance work and mapping in tropical Colombia, with its varied center hub of adequate communication facilities, the most difficult task of any kind. The Bundes has the distinction that for six months it did supply the "Santafé" one only to be fully realized when it is needed less even have been able to use the tropical foliage for conceal at that time not even able to use the sun above.

In Colombia and Venezuela, it will be recalled that there has been, in the past, much controversy over the question of an exact boundary line. In May, 1934, the British Engineers and Surveyors took aerial photographs of the entire frontier, and the surveyor handled, recorded the results of the International Aerial Survey of the Bundes to the air and take photographs of an area of about 1,500,000 acres north-southward of Lake Maracaibo. The entire survey was completed within



A WOODEN SERVICE TRAINING PLANE. The Consolidated CG-11 Wright Whirlwind has the cockpit just behind the engine. The plane is a Mayo CG-11 and is now equipped with compressed-air landing gear. Company sources state one of the uses to which the CG-11 will



Photo of the Brazilian Air Force on the Army Field at Leon, Brazil on May, 1937, there are apparently 6 B-29s, with Sabre Pioneiro aircraft on the left, a B-29, a Morane Saulnier with Le Rhône engine, an SVA, and two Klemm-Douglas (cylindrical engine).

45 total of 55 flying hours and one month of office work, which by the way would have required carrying away large amounts of underground, the expenditure of enormous amounts of money and power of the local market.

In connection with the possibilities of the aerial survey in Colombia, and, for that matter, in the whole of tropical South America, it will be of interest to quote the opinion expressed by Leon Degraeve, chief geologist of the Colón Development Company, as follows:

"During the short time spent in our flight over the Caquetá and from River from Leonidas to the Pacific Sea, I have been able to obtain an idea of the topography and drainage of the land which has been remarkable every after several years devoted to the study of this region. From this short flight I am convinced of the possibilities of the aerial photogrammetric method in the exploration of territories similar to that of the Terra Colombia valley."

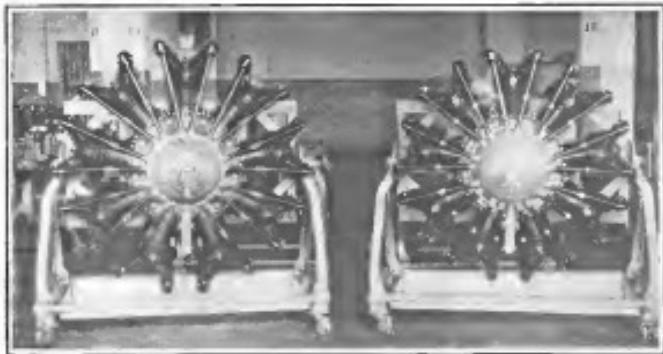
It is felt that the best way to build that during one survey flight, as in northern Colombia, a Motagua Indian village was discovered, its location before being absolutely unknown. The possibilities for aerial service in South America are calculated and the increased experience of United States commercial operators undoubtedly places this nation of our hemisphere in the most advantageous position to serve Latin American needs in the most efficient manner.

Peru

Peru is a country in which the development of aviation appears to have wide possibilities if for no other reason than that the government of the republic is friendly toward its development and the industries, which are very active, need the services of aircraft. The country is scattered and contains many rivers which totals 3,000 miles in length with a great network of inland travel to and from the interior by Indians.

Geographically, in the activities of the United States Naval Mission to Peru, the Peruvian government is taking a strong interest in the possibilities of the development of all forms of aviation. The mission, under the leadership of Commander George W. Dyer, has been invited to help develop aerial operations, with the result that since 1934 the Peruvians have made speed in the organization and building up of naval aviation, some definite activity is looked for in the immediate future. At the present time the flying division consists of a few war time surplus biplanes of European manufacture, and a few good pilots. Commandant Dyer will be recalled, said, in this country a few new planes with a view to purchase. Another aircraft for service in Peru. The plan for development is to have a naval air service in the Amazon River area, an air force operating a naval base personnel while at the same time making it a revenue source, useful and possibly self-supporting.

The Japanese Bureau of Meteorology No. 1935, provided for an airbase between Lima and Callao, which is in the northwest corner of Peru, over 700 miles from the coast and at the foot of the Andes Mountains. To reach Callao, it is necessary to cross the mountains, an altitude of 12,000 feet, and travel over the Andes at an altitude of 12,000 ft., as also to cross the Andes at a height of 17,000 ft. The latter method necessitates a journey of one day by trail, one by automobile, seven by pack mule, two days by



The Pratt & Whitney Hornet (left) and Wasp engine standing during assembly in design. The somewhat larger size of the former will be evident to carry proportionately large loads or torpedoes.

Now that their second type of engine is emerging from the experimental development class, it is interesting to review the development and present activities of the Pratt & Whitney Aircraft Company. It was less than two years ago this month, August, 1935—that the Pratt & Whitney Aircraft Company was formed and began operations. Within four months from that date the first experimental Wasp was placed upon the stand, and, after completed most successfully, within six months of its appearance in the test, thirteen of a permanent engine were constructed, and these were placed in the major single-engine fighter fighters—the Boeing and Curtis planes. They followed a long series of tests. As a result of these tests, which included the Boeing and Curtis fighters, in 1936, the North American announced its intention to adopt the aircraft model for its single-seat

two-place fighter plane. Their decision was based not only upon comparative performance characteristics, but because of the inherent simplicity of the radial air-cooled type of engine. As a direct result of this decision, an order for 300 Wasp engines was given to the Pratt & Whitney Aircraft Company.

In August, 1935, all of the activities of the Pratt & Whitney Aircraft Company were confined to a small corner of the present manufacturing building where engineering offices, as well as an experimental shop, occupied not more than 2,000 sq. ft. of floor space. The expansion from that time forward was rapid. The small experimental shop capable of fitting out only the basic engine was enlarged so as to provide the first experimental Wasp engine, which was successfully tested. So rapid was the evolution of the company in its Wasp engine that during the summer of 1936, the equipment



A general view of the assembly shop of the Pratt & Whitney Aircraft Company where Wasp and Hornet engines are built.

shop for the production of Wasp engines in quantity was installed. This logical and ready to the construction of machine tools, test equipment and other necessary manufacturing facilities, but even the special tools, jigs, and fixtures were present. As a result of this foresight, while the contract for the 300 Wasp engines was signed in early October, 1935, the first Wasp engine was produced May engines were delivered, the first of which completed a successful 100-hour test. In January, 1936, the first Wasp engine was shipped, being flown in February, and, early in March, the normal schedule of twenty Wasp engines per month was actually met.

The operations of the Pratt & Whitney Aircraft Company now extend throughout all floors of the building. The basement, the first floor is reserved for receiving, storage, and shipping, the second floor is a part of it used as the receiving and shipping department, and inspection of incoming material. The second floor is now given over to the assembly of engines, Government and plant inspectors, tool stores and supervisor's and legal shop. The third floor is entirely occupied by machine shop. The fourth floor is partially occupied by machine shop, and the fifth floor, present floor off the completely equipped floor, is a portion of the plant, the remainder of the machine tool equipment, as well as all other manufacturing facilities, are entirely new, and of the very finest type.

Research Facilities

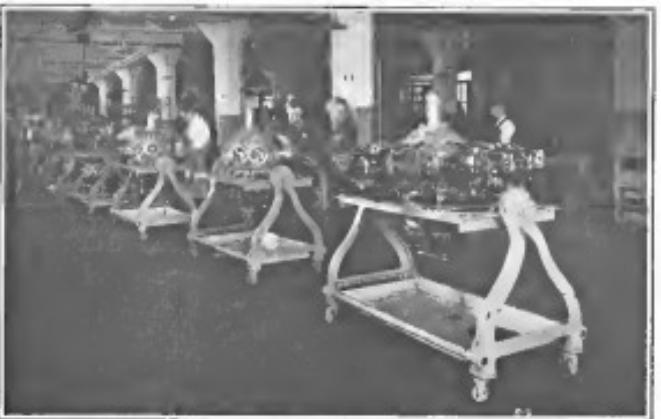
The Aircraft Division, which is entirely separate and distinct company from the Pratt & Whitney Company, manufactures all of the important metal engine parts of its product Curtiss twin parts not made directly by the Aircraft Company, particularly those of the Pratt & Whitney. These parts is made that these pieces, as well as engines, are the most advanced war-fighter parts. In the case of these parts, the equipment of the Pratt & Whitney Company is utilized to extremely good advantage. The splendid laboratories, well-reinforced

and heat-treating facilities of the Pratt & Whitney Company also magnificently employed by the Aircraft Company, these combine available facilities which, for the smaller company, would be out of hand and impossible. The equipment for testing engines is of unusual interest. The manufacturing plant is located in the very center of the city of Hartford, in spite of this there are at present seven non-housing, and it has been found possible to accommodate all of these in the same building, and it is fully thoroughly planned and equipped. This is accomplished through the maximum utilization of the space, during test, and the unique construction of the test houses which slopes straight up the nose from the propeller. Four test houses are available for the testing of production engines, having one test bay for the experimental testing of Wasp engines, and one for the experimental testing of Hornet engines. The second test house is employed mainly for research purposes. It is completely equipped with dynamometers, and provides for the testing of single-cylinder test engines, of either the Wasp or Hornet type.

Helium From Hydrogen

A report from Berlin states that two scientists working on the Chemical Institute of the Berlin University have succeeded in changing hydrogen, which is the lightest of all elements, into gaseous helium, which is the next lightest. The transformation of hydrogen into helium is brought about by means of what is known as a catalytic process. Platinum, a metal not unlike platinum, was selected as the catalytic agent. When hydrogen was subjected for a few days to the influence of finely distributed platinum, it was found that helium resulted in small quantities.

If the report is accurate, this significance of the experiments cannot be gainsaid. It will be the best time that anyone has obtained the discovery of a source when from a lighter gas. Whether or not it has no astronomical significance is, however, somewhat vague.



A wide-angle view of the main assembly shop of the Pratt & Whitney Aircraft Company. The "twinfold" beds upon which the engines are assembled are visible.



LT. G. R. HENDERSON, U.S.N., AND THE NAVY VOUGHT "CORSAIR" WITH "WASP" ENGINE.

A New World's Record with a "WASP" Engine.

With no unusual preparation, and in the course of its standard service test, Lieutenant Henderson established a new world's altitude record for seaplanes with a Navy Vought two-place Observation Fighter. The "Wasp" engine was not supercharged, and was a standard service type in every detail.

This remarkable performance is the natural result of superior plane and engine design, and skillful piloting. Again the Navy gives substantial proof that its flying officers and service equipment are second to none.

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D E P E N D A B L E E N G I N E S



THE NEW CURTISS "SEA HAWK" AND BOEING "FIGHTER"
BOTH "WASP" EQUIPPED.

New Navy Shipboard Fighters.

Competitive performance trials now in process at the Naval Air Station at Anacostia indicate a very superior performance to present service types.

These new planes are designed around the "Wasp," and it may safely be said that they will establish a new era in Naval aviation.

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ON AIRWAYS MAPS

D E P E N D A B L E E N G I N E S

The New Hamilton All-Metal Airplane

The Latest Product of the Hamilton Metalplane Company. A Four-Passenger All-Metal Monoplane

THE HAMILTON METALPLANE COMPANY, of Milwaukee, Wis., has just completed the construction of a truly distinctive monoplane, popularly known as "the plane of all-metal construction throughout." The cabin, which is very spacious, seats four passengers, whose view of the air space over which they are traveling is greatly enhanced by the numerous large windows arrangement provided. Owing to the depth of the cantilever wing, the ends of which cover a wide proportion of the side of the fuselage at the cabin, windows are provided on the lower surface of the wing stalk instead of on the side of the fuselage. At the point where this forward wing was joined past the side of the fuselage, an arm rest is provided giving the passenger elbow room not found in many cabin types of planes.

Access to the cabin is through a door in the left side of the fuselage and head room when entering is arranged for by having one of the wing windows to fold up. The pilot sits ahead of the passengers in an adjustable cockpit which is covered with a strenuous transparent covering from which he has no cockpit rain. The pilot's cockpit has an individual instrument. In the rear of the passenger cabin is a baggage compartment with a capacity of 30 cu. ft.

Metal Fuselage

The entire fuselage is metal cased and is of elliptical cross-section which not only endures for strength of construction but greatly reduces the heat resistance. The entire tail unit is metal cased and is mounted on a steel frame with steel tubing. The stabilizer is adjustable in flight and the rudder is operating arm or king post, is concealed behind the vertical fin which, also, is adjustable in flight. All control wires are carried inside the fuselage with the exception of a few feet leading to the rudder and ailerons.

The wings, which are full cantilevers and tapered in plan form and in thickness, are of a modified S.E.C.A. high lift section. The representation of the wings includes three total wire bracing of varying dimensions arranged individually. The two wings are extended to the fuselage by means of six large aluminum rivets each holding a fairing of either of our twenty.



The Hamilton Metalplane showing the nonflammable construction and the nonbreakable windows for the passengers.

Two forty gallon gasoline tanks are located on the wings providing gravity feed to the engine. The landing gear is of the newest split axle type with the compression strut running directly to the wing stalk and fitted with compression rubber shock absorbers. The wheels are 32 x 6 in. fitted with Goodyear tires and Sammuel locks. The undercarriage track is nine feet.



A general view of the Hamilton Metalplane, Wright Field, Ohio, during the method of carrying the top of the plane weight.

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Maywood, Illinois.
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B.B.T. FLOODLIGHTS AND BEACONS

were the FIRST to be developed for aviation

Catalog Gladly Mailed on Request

B.B.T. CORPORATION OF AMERICA





A general view of one of the planes of the Balsamo company, showing interior, wooden furniture, aluminum and magnesium.

The engine, a Wright Whirlwind, is mounted on a bulk wood frame. The propeller is a three-bladed metal Schenck. British engine maker and French manufacturers are standard equipment, together with a Hammon propeller, either of wood or of metal construction.

General Details

The general details of the plane are as follows:

Part	Material	Dimensions
Fuselage	Wood	12 ft. 8 in.
Wings	Wood	20 ft. 0 in.
Span	Wood	32 ft. 0 in.
Height	Wood	10 ft. 0 in.
Length overall	Wood	32 ft. 0 in.

The wings can be mounted in twenty minutes without bolts and the engine plate shipped in a space 12 ft. wide and 32 ft. long.

The Hammon Monoplane has been thoroughly flight tested by Agent Victor S. Berimando, formerly operations manager of the P.T.T. of Brazil, who points out that the aircraft may attain a height of 10,000 feet in the controls. The performance of the plane, as indicated by the air speed indicator, which is, of course, subject to accurate checking, is as follows:

Altitude	Speed
Sea level	110 m.p.h.
5,000 ft.	105 m.p.h.
10,000 ft.	100 m.p.h.

A load of 1,000 lbs. in addition to gasoline and oil was carried on this test and the take off was remarkably quick.

It is recommended that the Hammon Monoplane be used in flying schools as an ideal aircraft for novice drivers.

It will be recalled that the Hammon company (The English Aero Manufacturing Co.) also manufacture, in addition to both wood and metal propellers, distinctive guitars which have proven extremely successful fitted to several types of commercial aircraft.



A front view of the Hammon Monoplane, a high-wing monoplane with cabin accommodations for four passengers. The engine is a new Wright Whirlwind.

New Eaglecock Agents

Appropriate type certificates have been received from the Associate Bureau, Department of Commerce, Washington for both the standard and long wing Eaglecocks. These are slender and trim monoplanes, powered both in the nose section—either of the plane.

Walter E. Kyser, of the Alexander Aircraft Company, has made what is believed to be a record for long distance flights on the airplanes over a period of two weeks. Kyser flew from Eaglecock to the T. D. S. Aerial Service, New York City, arrived back at Devee and delivered one to the Southern Airplane Sales Company, Oklahoma, delivered next to the city and delivered one to Concord, Miss.

W. L. Johnson, Jr., has recently joined the Northern California office of the Alexander Aircraft Company, San Jose, to form a Marquette of Fresno. Mr. Marquette is a Brewster-York Avia man and will complete sales and sales test drives. This new dealer bought Standard's plane and has brought one older one Eaglecock from the Devee factory.

Rudi Horowitz and A. J. Murray, both pilots, have purchased a demonstrator Eaglecock from the Oklahoma dealer and have taken a trip down to Northwest Oklahoma.

At this writing another Alexander pilot expects to leave Devee in a day or so to join them.

Agent S. Charles Davis in Northern Carolina and Virginia has been awarded additional territory, the District of Columbia.

Aero Engine Performance

Mr. Leonard Harry, British Secretary of State for Air, recently referred, in the House of Commons, to the aircraft industry of modern engines, saying that some types now run 500 hr before it is necessary to have them overhauled.

The Napier Lion engine is a type which, by its reliability has established such efficiency to be attained, that it is not necessary to take a Napier Lion engine before it has run 200 hr—approximately 20,000 mts—and there is no more as a previous record because there is no need for work to be done to the engine.

Some Napier engines in use by the British Royal Air Force have been in service for over 400 hr without being disassembled.

On commercial aircraft Imperial Airways uses a number of Napier Lion engines. These naturally run for 300 hrs—approximately 30,000 mts—before it is considered necessary to take them to see if any work is required to be done.



Photo by Tom Weller

You can't "drown" Valspar!

DURING the recent floods in India, Valspar again demonstrated its wonderful waterproof qualities for which it is famous the world over. For hours at a time the Valspar houses of Calcutta had to plow through the flooded streets, but when the water and mud were wiped away, the Valspar finish always came up rendering.

Because Valspar is so remarkably waterproof and durable, it is the one varnish that is universally used to protect surfaces exposed to water, weather and hard wear. On surfaces of all kinds it has met with such widespread favor that now it is known the world over as the standard varnish for airplane use.

In the aviation service, Valspar has proven many times its remarkable ability to "stand the gaff." Valspar protected the N.C.A. "Raced-the-World" planes, Commander Byrd's North Pole Fokker and dozens of other famous planes, not to mention the many hundreds of planes in daily service.

Nitro-Valspar—the all-inquer finish As a companion to Valspar, Valentine & Company offer Nitro-Valspar, the all-inquer airplane finish. To be sure of satisfaction use Nitro-Valspar if you want lacquer, and Valspar if you want varnish. Each is the most durable and economical finish of its type in use today.



VALENTINE'S
VALSPAR
The Painted Metal Schneider Cup Winner

The Painted Metal
Schneider Cup Winner

Photo by Tom Weller

Stinson Produces Five-Place Cabin Monoplane

Wright-circled Engine Cabin Monoplane Machine Bears Striking Resemblance to Cabin Biplane

WHAT WILL undoubtedly prove one of the most interesting exhibits at the All-American Aircraft Show of May 10 will be held at the Langley Field, Virginia, on the expansive grounds occupied by the Douglas Aeroplane Corporation of Detroit. The fuselage of the plane is modeled after the Stinson biplane, while the exception of the cabin, which, as in the Douglas, is apertured or broken, with seats arranged like those of an automobile. The new plane is to be fitted with either Wright R-1820 engines, each developing 450 horsepower, instead of four, with intercoolers, as may be desired.

Like the biplane, it will be dual control machine. The front handles have been replaced with rear levers. The first ever to be used on airplanes. Also, the first air starter in a plane, as no airplane has been introduced in the last Stinson plane.



The Stinson five-place cabin monoplane. (Wright Whirlwind engine)

The Cabin Plane

By David L. Petreke

In the early days of flying, it was customary to seat the pilot as much as the space as possible. In the infancy of the art of aviation, it was perhaps a good idea, because of the general lack of knowledge and experience. To the point, as at that time most accidents were attributed to air pockets and by seating the pilot directly in front of the engine, it was thought that the chances were the best. About the time the engine was placed in the nose, the cockpit was elongated, making it provided more room for the pilot and expanded the pilot to all kinds of weather.

Progress has changed this and designers now place the pilot further in the rear, reducing him in a cockpit fitted with a windshield, with head and shoulder only exposed. For military purposes the cockpit arrangement is ideal. It provides limited protection from the weather and maximum speed and gives a degree of vision to the pilot which is only limited by other factors.

But to non-military flying, weather protection is absolutely necessary. Yet it is hard to appreciate the delicacy of many planes for the cabin plane.

I dredged the day when I was supposed to go to Detroit and bring back a cabin plane. But the day came and I started on my mission. After several trips around the field with Eddie Stevens, I took off for Minneapolis, through Chicago, Milwaukee, La Crosse and St. Paul. I carried a full load and needless to say was very worried. Things seemed so strange and different. Instead of the long and the noise of a racing engine, there was quiet. The rush of air was tho-

rough. In short, my passengers, as well as myself, were really uncomfortable while flying.

After several trips on the air mail run between the Two Cities and Chicago, I became accustomed to being encased while flying.

A properly designed cabin plane, with the pilot correctly seated, should give more room to the front and downward view than any other plane arrangement. Vision to the back and upward is not really necessary in a commercial plane. In a military plane it is just as important to be able to look directly backward as it is to see forward.

To be able to check into your plane dressed just as you would be for a spin in your motor car is also an essential of private flying. There are no binding belts or straps to hold you in.

Another and very important consideration is the fact that it is easier to be very much easier to roll the cabin plane in the event of a crash. Flying at the open, or the rear of the propeller end, the rear of a high-speed engine, the disconcerting roar of wind and weather, are facts not likely to attract purchasers who desire to fly with a minimum of effort.

Everyone should remember that the enclosed passenger cabin should be equipped with the same protection devices as the cockpit. Safety belts should be provided and these should be fastened firmly, all sharp points should be padded and doors should be arranged to open easily, in case of trouble.

The question is often asked if windows fog up and do frost and snow collect on the glass. In the winter's experience, I have never had windows fog, nor has he ever noticed frost and snow holding on the glass. The propeller blast does much to keep the forward glass free from snow and frost.



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INCREASED performance and reliability—better resistance to climatic changes and to the effects of rain, heat and salt spray—are some of the reasons for the increasing use of Standard Steel Propellers on modern Army, Navy, Commercial and Privately Owned Planes.

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Standard Steel, Adjustable Pitch, All Metal Propellers are designed not only for different power ranges but to give maximum performance under the most varied flying conditions.

STANDARD STEEL PROPELLER COMPANY

PITTSBURG, PENNSYLVANIA

The Bellanca Monoplane - Holder of the World Endurance Record

A Detailed Description of the Plane which Remained in the Air Over 51 hr. and Will Attempt the Atlantic

THIS REMARKABLE flight of Pietro Bellanca and Accorsi on April 22-24 in the Bellanca monoplane, which we saw at Washington, has brought the world's most dramatic Bellanca design engine into the limelight and while the machine is not new has it been neglected in the columns of *Aeronautics*. In the past, never detailed than has prominently been possible will not be out of place at this time.

Giuseppe M. Bellanca, a designer of international repute, first turned his attention to the design of the type of cabin monoplane of which the present record breaking machine is a development, in 1911. The very first machine of this type proved also with an increased engine power of 100 h.p. the plane winning thirteen prizes in various airplane events. In 1915, a later model of the same basic type, and built by the Wright Aeroplane Corporation and equipped with a Wright Whirlwind engine, was the highest efficiency prize for endurance won at the meeting at the Home of Model Field. In 1926 the Wright Company built a similar plane of the same type as Mr. Bellanca's design and it was this identical machine which set up the World endurance flight three weeks ago. The machine was equipped with auxiliary tanks for emergency flights at the National Air Races at Philadelphia last year and was, in fact, the first new machine when the record flight was made, nor was the Whirlwind engine, with which it ran, able to move having the slowest weight per fuel partake plane.

Thus, the Bellanca Monoplane is not an experimental design produced especially for record breaking but is a standard model commercial type and is, in fact, that selected machine in which the Wright Company, early this year turned out a test flight to Washington, D. C., from New York City with a full load of five passengers with a view to obtaining a figure of cost of operation for commercial purposes. It will be noted that the engine used is the same as that used in the record flight.

In the design of the plane, which is in one sector (including the pilot) side-by-side, every possible has been made for maximum safety. The landing speed is very low and the control at low speeds is very good. The pilot's vision is wide and unobstructed and considerable attention has been given to the reduction of the flat hazard.

The engine is a four cylinder, air-cooled, single cylinder, 250 h.p. The two types of propellers used are solid and semi-tensioned. The two types are of spruce, solid .75" beam section. The ribs are of spruce, have wood and balsa, with triangular bracing, making a very strong and light construction. The type of oil han-

dling tank to over 800 lb. before breaking. For a load factor of 7 take 225 lb. test load is required. Their weight is 12 kg. each and are located with the exception of one, which is located in the rear, so that the wing tip when it is at an angle can be seen, taper towards the top cap-plate. The wing consists of a fabric covered with seven coats of dope and one of Valspar. The two halves of the wing are joined to the fuselage by longitudinal and a series of the fuselage which is fixed to the wing section.

The wing is located externally by the well-known Bellanca latches, two on each side, consisting of two larger frames, the larger being a point about two-thirds of the spanwise from the wing root. These arms are located in the section of an airfoil of medium lift low drag contour. The use of these arms simplifies the wing construction and eliminates any possible weaknesses existing. Their section is also much like the more usual type of strut of was known in a biplane, while their 30 ft. more than compensates for their weight. Furthermore, they are mounted almost entirely in the lower side of the fuselage. It is claimed that the combination of these arms increases controllability at low speeds and stability greatly. The load factor of the Bellanca struts is 10. They are constructed of straight ground varnished spruce section "beam section and air space and have wood ribs. The leading edge are made of plywood and the trailing edge of mahogany. The outer surface is fabric covered with seven coats of dope and one of Valspar, as in the case of the wings.

The fuselage is constructed in three complete and separate units, the engine section, the cabin section and the tail section. The surfaces of the arrangement in that case insure can be replaced in a very short time without the major expense of a complete knock-down.

The inboard chrome-molyb掌 steel engine mount is hinged to the fuselage so that it, together with the oil tank and cooling system, can be moved out to the rear of the engine. The entire assembly weighing 120 lbs. When the engine mounting and the engine is a discoloration overall which covers the rest of the engine.

The engine surface and also the oil system, which together make up the entire engine, are constructed of chrome-molyb掌 steel tubes with the simplest form of fittings with a view to reducing cost of maintenance. The engine has seats for three passengers, in addition to the pilot, and contains a radio receiver and transmitter. Vision from the cabin, both for the pilot and the passengers, is perfect, as may readily be realized when it is noted that the cabin is surrounded by windows and the high position of the wing leaves an unobstructed vi-



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The Bellanca Monoplane (Wright Whirlwind, J-4, serial 38)

obstructed view down with the exception of the very narrow blind spots caused by the presence of the landing struts. The struts in the cockpit are considerably strengthened.

The total span in the cabin is 106 ft. 4 in., not including that devoted to the pilot which would indicate that the machine is well suited to most air freight transport by air.

The engine is a Wright Whirlwind J-4, which is a six-cylinder air-cooled motor as already mentioned, as attached to the cabin section by means of four pins. The tail unit, including fin and rudder, is constructed of spruce, bass wood and oak, covered with fabric, dope and varnished. The elevators are balanced, while the rudder, of single can, is balanced. The undercarriage is of the split-type although the steerable tail "canard" which characterized the 1926 machine has been replaced. The tail skid, of birch, is located entirely outside the fuselage and can, therefore, be readily demounted and replaced.

The gasoline tanks, two in number, are located one in each wing root, with a total capacity of 85 gal. These tanks are constructed of welded sheet aluminum and the fuel is, of course, of the gravity type. An reported flight in America, just as round the world, was made last week in the machine with a propeller free up to the wing tanks. The gas-

oline lines are of copper tubing and are located with a view to their being easily removable. With the 8 gal. oil tank in the engine section, gravity fuel feed, and no water at all, the plumbing is brought to a minimum.

The present details of the plane are:

	Spec.	Actual
Length	30 ft. 8 in.	30 ft. 8 in.
Width	10 ft. 0 in.	10 ft. 0 in.
Height	6 ft. 7 in.	6 ft. 7 in.
Wing area	300 sq. ft.	300 sq. ft.
Weight, empty	1,000 lb.	1,000 lb.
Weight, per head	1,000 lb.	1,000 lb.
Weight, per passenger	200 lb.	200 lb.
Weight, per square ft.	12 lb.	12 lb.

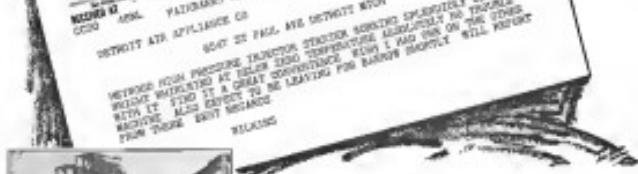
The following performance data, supplied by the manufacturer, was obtained with pilot, five passengers, averaging 176 lb. per person, and 250 lb. of baggage. The tanks were full. The total weight of the payload was 1,805 lb. -

Take off (1,805 lb.)	100 m.p.h.
Cruising speed (100 m.p.h.)	100 m.p.h.
Rate of climb at 100 m.p.h.	22 min. 9 sec.
Rate of climb at 100 m.p.h. when loaded 15 min. per 1,000 ft.	15 min. per 1,000 ft.
Service ceiling	10,000 ft.
Rate of climb at 10,000 ft.	200 ft. in 10 sec.



A close up of the Bellanca Monoplane (Wright Whirlwind) during landing for the endurance flight.

Where Starting Must Be Dependable



Showering installation of Heywood High Pressure Injector Starter on Wright Whirlwind Master. Wright 35 lbs.

Pilots, whether in arctic cold or tropic heat, know the absolute necessity of dependable starting.

Wilkins prepared for his polar flight by installing the Heywood High Pressure Injector Starter on one of his planes realizing its dependability and instant starting features. His telegram confirms his judgment in this selection.

Eddie Stinson too appreciates and recommends this never failing starter as the highest type of aircraft equipment.

Simple pressing of button, conveniently located on dash, producing a positive, instant start thru high compression and forced carburetion are features that have earned this enviable recognition of supremacy.

Write today for complete information, technical data, prices etc.

DETROIT AIR APPLIANCE CORP.
6547 ST. PAUL AVE. • • • DETROIT, MICH.

Manufacturers of Heywood High Pressure Injector Starter

The Airport—A Municipal Stepchild

Western Municipalities Take Cognizance of Growth of Commercial Aviation And Plan Airport Projects Aggregating Approximately \$2,000,000

FOR YEARS the airport has been the stepchild of the municipal family, neglected, dusty and forlorn, while attention has been lavished upon those promising towns, Richmonds and Shoppings. Nobody seems much about it except a short time ago when the rest of the country was talking "airways." Notice that anybody who could use was permitted to be supplied by it. Any old space that vaguely existed, or thought they might want in future, was good enough for it. Even today there is no western city able to boast a first class airport and one, at least, has a field that is dangerous dangerous.

Not now. The stepchild has been named in old Uncle Prosperity's will and the rest of the relatives can't do much for him. In fact, he seems likely to become the pride of the family. It used to be that when a city was too small and could not afford a municipal airport, it was planned enough for those long journeys to go made their time in trying to make some fool contribution try, but not any more. Some western cities have proposed or are authorized airport projects aggregating an investment of approximately \$20,000,000 and this is typical. Other communities are doing or have done as well proportionately.

Millions Spent on Airports

Indeed, it seems that within the year a wave of interest in airports and aircraft airports has swept over the entire Pacific coast region, with the result that Portland has almost completed a \$1,200,000 airport; San Francisco has spent nearly \$100,000 in leasing and improving a temporary field and is continuing to build a permanent field at a cost approaching \$1,000,000 more. Oakland has committed itself to the expenditure of \$600,000 for new land on which to build an airport. Everett has voted \$100,000 for a field and has engaged a man, which means he need not look to the State legislature for funds. Santa Monica has spent \$600,000 for a city air base. San Diego has plans for an \$800,000 model airport under way; and in Los Angeles the only concern is loudly endeavoring to discover a site on which to build an airport that will meet it, if it is estimated by members of the emergency support committee, \$10,000,000 to \$12,000,000 of the emergency support committee. This is only a partial list of what the cities that are in the lead are doing, and a host more is noted upon the pages of this issue.

Along with these major projects should be mentioned the smaller ones where, though no additional expenditures of significance at county money are anticipated at present, a great deal of preparatory work has been done in recent months. These include the Boise Municipal Airport, representing an investment of between \$600,000 and \$800,000; Bentsen Field at Medford, Oregon; the Kern County Airport at Bakersfield; Modesto, Calif.; Fresno; Phoenix; and the new airport at Las Vegas, Nevada. Though the total value of all these enterprises does not approach as much as a single one of the larger cities will spend, yet considering the proportions of wealth of these smaller communities it presents a striking evidence of the new attitude toward aviation.

Except during Moles, all the fields named are used by the air mail. Indeed, it was the needs of the new airmail service routes which called most of them into being. Santa Monica's enterprise is a definitely commercial affair, while the others are city government in an effort to make that city, already the home of the Douglas company, a larger aircraft manufacturing center.

In setting up these fields, financial problems of some magnitude have been encountered and solved in almost as many

ways as there are fields. Portland's enterprise has been financed and will be carried to completion through the Port of Portland Commission. This body, taking the view that a port was a port whether for air travel or no travel, has assumed the function of providing the city with an air harbor in the city with other and perhaps far more important functions. The money for the enterprise has come from postage free, rentals of reclaimed land and other revenue sources, so that the cost of the airport has been met without taking a penny directly from the pocket of the taxpayer or fleecing a defenseless world of birds.

To Encourage Macaroni

A somewhat similar plan is contemplated by Oakland, based on a site far out airport. The two proposals have a further point of resemblance in that their proponents hope to have each become a factor for aircraft manufacturers. Oakland's plan is not so definitely operationalized as is Portland's, but the northern city's project may be completed by Elmer in a year. On the site of the inland and the Oakland field is already filled with dirt, it is not as far behind. The Oakland Rotarians, like Elmer of Portland, in no case do not see the advantage of the port.

Medford, Boise and Santa Monica have made their progress in the reader by considering the airport as a part of their sewage or drainage system, with one difference however—Medford and Boise have utilized riverbottom land as a site for construction of their air field while Santa Monica has rented an acre of land from the California parks and playgrounds association. The latter, it is true, is not to the best taste in virtually a city community, but, by promising to the town that the city's limit on leased landholdings was not involved, flood insurance premiums were kept down.

Both Medford and Boise have spent money derived directly from taxes to improve their airports. Boise laying land to the extent of nearly \$250,000 as a "pump." The remainder of the field has been taken as a park since time before. The Boise airport has the distinction of being only a mile from the city's business section. The smallest distance of any western air mail field from the city's post office.

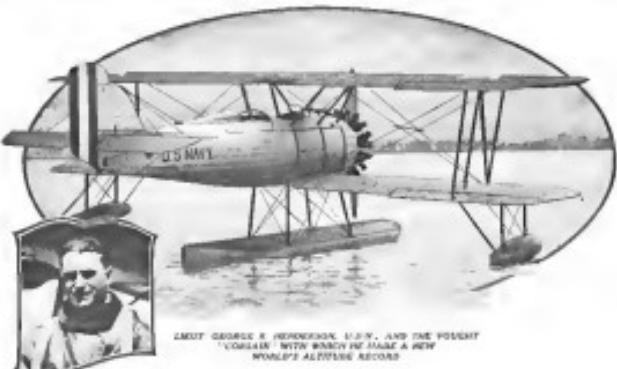
The land selected at Medford is exactly opposite, being the eastern portion of a marsh near the city's drainage area.

The Fresno field is owned by the county, having been taken over as a tax lot. The Bakersfield airport is leased by the county from private owners. The city of Reno and the County of Washoe jointly own the field at Reno. Ryan Field and Van Field, at Los Angeles, and respectively by the Pacific Air Transport and the Western Air Express, and contractors are bound from private parties.

Field Costs Considerable Sum

It is only one case, that at Fresno, is any considerable sum paid for the use of a field, either by public body or private contractors. The Fresno Chamber of Commerce has been paying \$500 a year rent on a field there which is thrown open to public use free. This does not represent the only costs involved, private contractors having the legal authority to demand money for storage as such is finding. Estimates of several municipalities, notably at Salt Lake City, have

Altitude Performance



PILOT GEORGE R. HENDERSON, U.S.N., AND THE VOUGHT "CORSAIR" WITH WHICH HE MADE A NEW WORLD'S ALTITUDE RECORD

A STANDARD "Corsair" Service Seaplane, piloted by Lt. George R. Henderson, U.S.N., established, on April 16th, a new World's Altitude Record carrying 500 kilograms (1102 pounds)

The official height announced was 6,760 Meters or 22,178 feet.

The actual Useful Load carried exceeded 1600 pounds, including pilot, fuel, equipment, etc., and 1102 pounds ballast.

This new Vought has been in active ser-

vice since last October, and made its record breaking flight as a fitting climax to the successful completion of Official Navy Department Service Tests wherein it had conclusively demonstrated its Superior Performance, Flying Qualities and Suitability.

The Record was made without special preparations, the airplane, engine and propeller being the original service equipment delivered in October, 1936, and used, without change or modification, in all flights since.



The "Corsair" is an airplane designed by the competent Vought Engineering Organization, around the P. & W. "Wasp" Engine.

CHANCE VOUGHT CORPORATION
LONG ISLAND CITY, NEW YORK

long, called upon to build hangars for railroad and operators. That at \$100,000 per acre, plus interest 12%, is a small task, paid by the operators, who in turn exacted the contributions who raised the \$175,000 to build the hangars.

The financing of the Los Angeles airport, when it is built, probably will go through a local way, in the view of the small airport committee and others interested. Whether, however, this will be a city bond issue or one serving an amateur function, using the plan adopted at Santa Maria, is unsettled.

San Francisco's Problem

How San Francisco's financing is to be done is not yet settled. The preliminary expenditures have all come out of a budget sum covered by the tax rate. Indeed, San Francisco apparently is the only city in the West with legal authority to expand money from taxes on an airport. This is because the return a year ago appeared a smaller amount than anticipated, so far as the cost of building the San Francisco airport in the only city, as far as is known, which is making any detailed scientific arrangement as to the desirability of various sites before buying its municipal flying field. Local conditions admittedly vary a great deal as the San Francisco peninsula and the airport committee of the supervisors, the city's governing body, had an easy meeting after the first investigation was made a second time.

The inquiry included the placing of recording instruments at all sites of the proposed site by the Weather Bureau. The records from these instruments will be used as a basis a year from for determining the meteorological conditions of each. The inquiry also includes test flights and landings to be made over the sites visited usually by Air Corps planes. The city is leaving the expense of these investigations. The airport committee, under Chairman Mike T. Morris, also arranged to have its own investigation visit all the air mail fields in the West and report on conditions at such, to aid the committee in determining what improvements should be made were it brought the load for the port.

Differences among the supervisors seem to have turned some sort of a loose-parliament arrangement for acquiring the land, which would be given to the city on an acre-for-acre basis, until the purchase price has been paid. Municipalities may well hold the land under lease. This is favored in practice since a bond issue between the city has a number of other projects which will require issuance of bonds and it is desired to concentrate the handling power. However, the amendment-draft plan adopted by State Notes last winter appears in San Francisco.

The difficulty is that the bonding power has been cut off

two years previous preventing other cities from raising bonds for the construction of airports. The other deterrent is the reluctance of city governments to ask authority to issue se-

curities in such large amounts as have been necessary for construction of some aerial harbors. Use of tax money presents legal complications, particularly regarding a few years' period during which such should be distributed.

An airport presents this peculiarity, as distinguished from all other public improvements, the great bulk of its cost is initial. If a city has a harbor which it desires to develop, the work can be spread over a number of years. Roads, streets, sewers, even parts of a water supply system, can be built a little at a time, as needed—or as funds become available. But an airport must be completed in a single year. The land, which must be purchased in order to make sufficient landing space is adequate for a score—or hundred airplanes.

The only solutions necessary to enable any reasonably large airport to handle more planes are more hangars, increased office space and such improvements, representing relatively little a small portion of the rest of the utility as a whole.

Admittedly, we need not sit at a panel that it must exceed the capacity of the heavy industries to build an airport in different districts the development can be slow, not a little in advance of the demands of commerce. A street system is differently; its extension can be pursued a little at a time, as residents are built farther and farther from the city's center. Either flies its own way, as very nearly does on, the one through the increasing volume of drooping feet and the other through the increased value of property and hence larger return of taxes.

But an airport requires a large expenditure which must be sprung on the public state road, with no opportunity of making it pay its way for some time to come. At the same time, the factitious city government is confronted with the fact that if it does not provide facilities for aviation now, competition will draw the travel and air commerce elsewhere.

The city has been in a series of legal litigations—at least they are described as such or as open cases—in the attempt to get a part of the city's harbor, or something else, which recently seems to be its legislative action—powerful committees to construct airports on their now are empowered to construct roads, bridges, docks, and other public works.

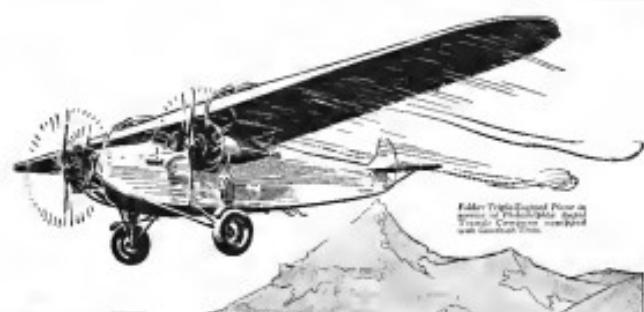
Merely, there is no difference between one public work and another,—between a harbor, which is a utility and an airport, which is a capital utility designed to accommodate another kind of traffic. The right to have an airport, for which no legal provision has been made. There is no question of moral fault that it is just as right for a city to bond itself to establish an airport as it is for the same city to bond itself to build a dock.

However, there is a legal doubt and when one such article leaves it in the aftermath for the bond issues to find it! Bonds involving a legal doubt simply are not valid.

Therefore, airports must be built, and the only way to establish them may have troubles, though there is nothing in the law to indicate that governmental bodies are willing to do all the tax affairs there to do and sometimes to bend the head under a trifle.



The Biplane Museum plane recently purchased by the Panama Aeroplane Co., for exhibition at the 1932 Pan American Games in Montreal, Quebec, Canada.



Fokker Triplane. First in series of Philadelphia design Triplane Company, combined with Standard Corp.

Building Aerial Supremacy!

Goodrich has ever kept pace with every development in motor transportation.

The same policy holds in the field of aviation—for Goodrich makes tires for every requirement in airplane transportation.

Two new developments in Aircraft Tires by Goodrich are the new 18x3¹₂ and 20x3¹₂ for straight side rims. These round out the line, which now contains a complete range of sizes from 18x3¹₂ to 60x14¹₂.

For smooth take-offs and safe landings use Goodrich Airplane Tires!

THE B. F. GOODRICH RUBBER COMPANY
Established 1891 Akron, Ohio

Goodrich

Aeronautical Accessories

Goodrich Ring-Type Shock Absorbers

For maximum safety. Multiple strands of tough rubber compressed near double woven casing. If one ring breaks the liner is not penetrated by the other rings and only the broken one need be replaced.



Captain Wilkins' DeHavilland Moth biplane flying over the Arctic Ocean.

(Courtesy Photo)

Captain Wilkins Safe

Capt. George H. Wilkins, commanding the Dorval North-West Air Expedition from which he had been separated since March 25, when he sent a message that he was down on the ice, 125 mi. from Point Barrow, was reported safe at Beaufort Post, Alaska, April 20.

Captains Wilkins and Capt. R. E. Nichols started as March 20 for an exploration flight over the unexplored Arctic region north of Alaska. The plane carried fuel sufficient for a four-hour tour flight and Captain Wilkins planned to be 800 mi. from the Point Barrow base. After Graham and Nichols had gone, made nine flights in a solo plane from Point Barrow in search of the missing flyers. They found no trace of them or of the plane. Graham returned to Fairbanks for supplies, but expected to locate the lost Captain Wilkins around a food supply station far to the west.

Brodsky Point, where Captain Wilkins and Graham now are, is at the mouth of the Colville River, 125 mi. east of Point Barrow, Alaska.

During the three weeks they have been separated, they have managed to live mostly on the ice, over the top of that land, which is the only point of shelter in the great stretch of ice and snow. Details are lacking as to the landing and takeoff of the plane.

Samuel Untermeyer Flies To Jerusalem

Samuel Untermeyer, president of the Palestine Foundation, arrived in Jerusalem April 2, in an Imperial Airways airplane from Cairo. The trip was rough and the plane had to drop thirty miles over the Mediterranean to avoid a sand storm.



The Bissell De Havilland cabin plane (Whitfield aircraft) of the Dorval North-West Air Expedition under the leadership of Captain Wilkins. The plane was of distinctive construction.

ARE YOU REPRESENTED IN THESE COUNTRIES?



If not, you are neglecting one of the most fertile markets for the aircraft industry in the world.

There is an exceptional demand, now, in these countries for modern American aircraft of all types; also motors, parts and supplies.

First Air Route Map

It is understood that the first survey map of the Department of Commerce is soon to be published. The route intended in this first map is from Kansas City, Mo., to Manaus, Brazil, by way of St. Joseph, Mo., or Arkansas, or over the 3000-mile route.

All preliminary drafting on the map has been completed by the Coast and Geodetic Survey of the Commerce Department. A. J. Uremian, one of the chief experts of the Coast and Geodetic Survey, is now in Kansas City to make a flight over the route and check up on the accuracy of the new map under flight conditions. He made a flight, accompanied by Capt. W. H. Smith, U. S. Army, flying from Robins Field, Kansas City. As soon as the map has been carefully checked, through an aerial flight, it will be corrected, if necessary, and published by the Coast and Geodetic Survey.

All survey maps, either Air Corps or hydrographic offices are now available at the Department of Commerce.

Our policy of representing only one manufacturer of any product (we do not represent competing companies) assures our clients of complete and thorough representation.

Visit our booth at the air show at Bolling Field, or let us tell you by mail of the thorough manner in which we tell the *entire* story of our clients' products.

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REPRESENTING: Wright Aeron. Engr. Fastrail Co., Inc., Pitmech Ind. Co., Elkhorn Mfg. Co., J. W. Wood Electric Mfg. Co., Textron, Inc., Beechcraft Brothers, Vultee Aircraft Mfg. Co., New Haven Foundry Co., Aero Metals Co., Inc.

A High Pressure Injector Starter

One of the latest improvements in aircraft engines is the high pressure injector starter for aircraft engines, developed by the Detroit Aircraft Corporation. Engines of great power and high compression such as the Pratt & Whitney R-1820s and others will start, particularly in cold weather, due to the efficiency it gives sufficient speed of rotation to cause the carburetor to function properly. The high pressure injector starter has been designed to overcome this difficulty.

The starter comprises a small crank or cam-driven air compressor, a smaller fuel valve unit, about 670 cu. in. capacity, an endurance valve which releases the load at 375 rpm., and a control valve which permits the fuel to enter the cylinders, distributor and engine cooling. The complete starter weighs between 25 and 35 lb. Every part of the starter reflects precision in design and workmanship and the assembled starter is compact and easy to assemble.

The pilot, by merely pressing a button, releases compressed air from the tank to the distribution which is timed and relates with the engine. The greater portion of the air is conducted to the cylinder valves in the power plant. Estimated at the time the new device was introduced, the cost of the engine and engine cooling system, including the injector, will be approximately \$1,000. The injector starts when the engine is complete or slightly past top dead center, with the object of insuring the maximum starting torque by the use of fuel. It is also designed so that any time the engine starts into action and the start is incomplete, the starter is entirely automatic and is operated from the pilot's cockpit, enabling the pilot to start his engine without any assistance.

Commander De Pinedo in Washington

Comdr. Francisco de Pinedo arrived in Washington on April 18, from the Pacific Coast for a short stay before leaving for New York to receive the new airplane in which he will commence the Four-Continents Flight. The new plane, the Stinson Model 10, which will replace the one destroyed by fire in Argentina, was brought to Italy by Comdr. de Pinedo on April 10, and will be shipped to New York the next day.

The Italian Ambassador, Giovanni de Martino and members of the embassy staff and Commander de Pinedo at the station and on the eveing of his arrival gave a reception and dinner at the embassy in his honor. He was presented to President Coolidge the next day.

During his stay in Washington, Commander de Pinedo visited the Army and Navy air fields and was the guest at a series of luncheons and receptions.



Some of the group who met Comdr. Francisco de Pinedo at the airport in Washington, last Friday. Left to right: Lt. Col. William A. Gandy of the Air Corps; Comdr. Edward J. O'Gorman, Royal Canadian Air Force; Comdr. George W. Smith of the Royal Spanish Air Force; and Comdr. George W. Smith, U.S. Navy. De Pinedo is the pilot of the Stinson Model 10 which he will use in his flight around the world. The plane was built in the United States and will be used in the Four Continents flight.

Baton Valley Air Meet

A definite announcement has just been made of the Air Meet to be held at Baton Valley, Wash., June 10, 11 and 12. The meet will be held in the same manner as the annual three miles west of Yakima on State Road 202.

The contests will include two exactly new types of cross country races: a speed race, a dead stick precision landing contest and a pony express race.

The rules of the cross country races eliminate formations and landings, which have always been a source of controversy. The tasks are considerably speed only, and the other

The speed race will be of the conventional type with the exception that it will be run in two preliminary and one final heats, and all planes will start from an at rest position with engines running, in groups not exceeding five planes.

The pony express race was originated for use in the Seattle Coast Air Races held on May 20 and because of its novel features will be run at the Ford Airport during the first Ford Redwood Derby on June 10.

All planes will start from an at rest position with engines running, in groups of not more than four planes. The pilots are required to land at the completion of each lap, start off their engines, personally exchange a panel with the judge, and resume flight. The race for the laps on a three mile course. The winner will be determined by elapsed time.

The dead stick contest will be governed by the point at which the plane comes to a complete stop.

By means of an annual division of the purse, every contestant is assured of at least sufficient prize money to pay his expenses. The prizes vary from \$200 for first money to consolation prizes of \$25-\$30 a race per man.

The officials of the meet are: Louis S. Knowles, N.A.A. contest committee representative; H. A. Scott, referee; C. G. Beynon, race director; G. L. Gandy, race manager; and W. E. Gandy, race director. The race manager, who has earned distinction as an authority on several previous aviation contests, will handle the "milk" at the pits.

The contests are to be conducted under N.A.A. scratch and will be open to any pilot holding an F.A.I. certificate and N.A.A. speedling license who has a Federal license, any grade, or who has applied for a Federal license and has not as yet been examined. Requirements for F.A.I. certificates and speedling licenses are the same as at the Tiptonfield Airport, June 9, 10, and 11 for those who have not already qualified. Entries close June 1, 1937.

The program is so arranged that all participants will be allowed to carry passengers from 4:00 p.m. until dark each night. Ride tickets are sold by the management, including all farewells, gratuity, and the gross receipts from rides divided equally between the pilot who carry the passengers and the Baton Valley Flying Club. Under this arrangement, twelve hundred passengers were carried at the First Air Meet in 1936.



The Aviation Board of the Department of Commerce over the Stinson Detrotiers equipped with motor, trailer, basket aerial and fire-proof cabin for four persons.

Stinson - Detrotiers America's Finest Aircraft

Lead In Design, Performance and Sales

Ask these owners about
the Detrotier:

Stinson Aircraft Inc.
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Wayne A. Smith Team Company
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John David Dodge
Capt. George Hobson Wilkins
Dale M. Wilkins
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BEYOND compare in comfort, safety and speed, Stinson planes have set the standard for modern aircraft. They were first to combine brakes on the wheels, starters on the motors, sound and fireproof heated cabins, luxurious upholstery and inherent stability so marked that they fit themselves in the air.

Other manufacturers have been quick to adopt these features developed as a result of the practical experience of Edward A. Stinson, who has flown more miles, trained more pilots and tested more planes than any other man. Stinson-Detrotier sales lead their field, because everywhere the Detrotier is accepted as the supreme embodiment of comfort, economy and efficiency.

Let us tell you how the Detrotier can solve your problems, be it in mail, aerial taxi service, business, pleasure, photography or training.

Stinson Aircraft Corporation, - - - Detroit, Michigan
Factory, Northville, Michigan

BELLANCA



Airvention Magazine, in its issue of April 25, 1927, says editorially:

"THE fact that the plane was not designed especially for load carrying nor was it in any way a special job, makes the record flight all the more interesting from the mechanical standpoint. The Bellanca monoplane was designed as a commercial plane with commercial operation the primary motive, a factor which is seldom given much thought in the development of a record-breaking machine. The plane has a high speed and in general all-round performance is far superior to that of the type of plane which generally

is expected to set up endurance records. Yet, everyone who witnessed the start of the flight was impressed with the ease with which the Bellanca plane took off and the rate of climb in spite of the heavy load of gasoline which it was carrying. Furthermore, the fact that, upon the completion of the flight, neither pilot appeared to be unduly exhausted speaks well for the general qualities of the plane and sounds a significant note in favor of the closed cabin type of machine."

Supremacy

and the
World's Endurance Record

WHEN pilots Clarence D. Chamberlin and Bertrand B. Acosta landed the Wright-engined Bellanca Commercial Cabin Monoplane on Roosevelt Field, Long Island, on April 14, after remaining continuously in the air for 51 hours, 11 minutes and 20 seconds, they brought back to America one of the world's premier air records by a margin of nearly six hours; a record which, more than any other, stands for advanced design and performance.

For the airplane operator or air transport executive the emphatic message of the endurance record is that the Bellanca design has given to the world a more efficient and economical commercial plane—a plane combining with ample safety factors, an extraordinary load carrying ability, excellent maneuverability and controllability, quick takeoff, high air speed and slow landing speed—all essential factors in the conduct of profitable air transportation.

Fall references upon request

**COLUMBIA AIRCRAFT
CORPORATION**

5104 WOOLWORTH BUILDING, NEW YORK CITY



Aerial Photography Aids Highway Improvement Plans

*Experience in Planning for Buffalo's Crossing
Traffic Needs Shows Value of Aerial Surveys*

UNDER the caption, "How Aerial Maps Aid in Planning Highway Improvement," in the March issue of "Highway Maintenance," George C. Dill, County engineer, Erie County, N. Y., discusses the value of aerial photography and surveying to the laying out of main highways. Mr. Dill discusses the details of the aerial survey and map which is being made of Erie County primarily for the purpose of a general study of the Greater Buffalo System and the preliminary ground location of the various roads comprising the system. The survey was authorized by the Board of Supervisors and is being made under the direction of the County Engineer.

Mr. Dill says in part:

"For the purpose of an aerial survey ground controls are necessary, together with a skillful pilot and photographer. To bring photographs to scale they must be taken from a fixed height. Both the plane and the camera must be especially adapted to this use. The photographs are taken vertically from a height which, in an overcast, will easily accommodate a large area, lessening the chance of having to make a second picture of the terrain, included in the original one. Photographic surveys of areas of traffic routes across the region may be used for control."

The flying and photography was done at an elevation of 9,000 ft. and the finished map is 800 ft. to the inch. With few exceptions the central points are two miles, or less, distant from each other. Pictures of sufficient roads were made for the control. Most of these had not been surveyed before, so photogrammetric instruments and data of these surveys were used in placing the control. Nevertheless, it was necessary to run many miles of new traverse.

The work time or money, however, should not be spent on maps not required for surveying. This is controlled, though, by the economy required of the completed map. The plotting of a control map in the ordinary drafting room, to cover 175 square miles of territory on a scale of 1 in. to the mile, at a cost of labor and materials can range from \$100 to \$1,000, and to return the work for the purpose of closing an error in traverse may be time wasted. In attempting to close traverses several miles in length it is readily seen that a failure to close, when the error is less than one per cent, is all that practical precision requires.

The map was made to show the relationship of not to exceed one mile between the control map and the aerial map with controls on the former set over two miles apart. In other words, the aerial map was required to agree with the control map within 800 ft., taking each way from control points two miles apart.



The school of the Pan-American Flying at Trieste.

Cameron Made Air King Agents

Louis Cameron, of the Cameron Aviation Company, of Toledo, Ohio, has just returned from Lasers, St. Louis, where he conducted a course in the use of the Air King.

The Cameron Aviation Company has signed a license contract for the entire state of Ohio and will act as exclusive sales agency for Air King aeroplanes. Lelley Davis, chief pilot of the Cameron Aviation Company accompanied Mr. Cameron and is responsible over the performance of the Air King.

In addition to placing orders for regularly equipped planes, the Cameron Aviation Company has ordered one Air King with a special Hispano engine. This particular machine has been sold by the Cameron Aviation Company.



Thorobreds, Every One! *They're Travel Airs*

THE BI-PLANES, a Whirlwind and an OX-5, are "doing their stuff" at the All-America Aircraft Display at Washington this week, with G. A. Wies in charge. (George is New York representative of Travel Air).

The monoplane, already a stalwart youngster of the Travel Air family, could not be present—

IMPATIENT BUYERS HAVE DEPRIVED US OF EVEN OUR EXHIBITION SHIPS.

Travel Air literature sent to anyone on request.



TRAVEL AIR MFG. CO., Inc.

Factory and General Office
WICHITA, KANSAS

Life Insurance for Those Who Fly

Readers of AVIATION will be interested to know that it is now possible for fliers to secure life insurance coverage up to high limits of indemnity. Until now, while certain insurance companies have arranged themselves to insure the lives of aviators, no one, however, has provided the fact that such coverage has only been obtainable within certain low amount limits. Moreover, such policies have been applicable only to certain classes of fliers.

Now, however, through the endeavor of Barber & Baldwin, Inc., at New York City, representing the United States Life Insurance Co., it is possible for any pilot or passenger, an experienced aviator or not, to secure a life insurance policy covering a life policy up to a maximum indemnity of \$50,000. The premium is payable for terms longer than the legislative limit of indemnity benefits available and the subscription of this form of aviation insurance can only be required as one of the most important steps in the arrangement with this firm.

The firm of Barber & Baldwin, Inc., it will be recalled, are promoters of aviation insurance. It is fitting, therefore, that it should be as a result very largely of the personal efforts of H. L. Barber, president of the company, that this insurance has been made possible. It was Mr. Barber, in fact, who wrote the very first aviation insurance policy, a Lloyd's policy, back in 1923, and it has long experience, together with that of other members of the firm of Barber & Baldwin, that this latest line of aviation insurance is made possible.

Under the terms of the new U. S. Life Insurance Co. policy, one may carry his life against all risks, including those of flying and can, when he dies, apply toward the summons to disburse the aviation risk, or when he dies the premium on the policy would be reduced according to his age. In this new life policy, the extra premium due to the aviation coverage may be dropped in the event that the named goes up flying and his policy would become an ordinary life policy. This feature is extremely important since it relieves the necessity of always taking out standard aviation policies which become useless when the flier retires from active flying.

Robertson Purchases Kentucky Stock

The stock of airplane accountants, recently offered for sale by the Kentucky Aircraft Company, of Cincinnati, Ky., was purchased by the Robertson Aircraft Corporation, and shipped to St. Louis.



King Albert of Belgium presented a flag to Robertson Aircraft Corp. for exhibition in their plant recently. The aircraft shown is an Avro 504K, which was used in the King Albert's Official Visit to America. It is the International Standard of Aviation. Other planes in the King Albert's Official Visit were the Fokker Triplane and the Fokker Triplane.

Insurance for French Fliers

An insurance bill has been approved by the French Ministry of Finance which will provide insurance for all aviation accidents in the Government service. The insurance money will be paid for by the accident, but the bill leaves it to the Government Service to cover this

Bibliography of Aeronautics, 1924

This work, published by the National Advisory Committee for Aeronautics, covers the literature published from Jan. 1, to Dec. 31, 1924, and contains the work of the Smithsonian Institution issued in volume 55 of the Smithsonian Institution Collection, which covered the material published prior to June 30, 1920, and the work of the National Advisory Committee for Aeronautics as published in the Bibliography of Aeronautics for the years 1919 to 1920, 1921, 1922, 1923, 1924, and 1925.

As in the Smithsonian version and in the Bibliography of Aeronautics for the years 1919 to 1920, 1921 to 1923, 1922 to 1923, 1923 to 1924, extracts of the publications of all countries have been included in the language in which these publications originally appeared. The arrangement is as follows: item with author and subject entry, and an alphabetical arrangement. Data in the matter of subject headings has been included, and also of the cost of premiums, but no attempt has been made to give sufficient information for research at special interest.

The Bibliography of Aeronautics, 1925, contains 153 pages and may be obtained direct from the Superintendent of Documents, Government Printer Office, Washington, D. C., at 25 cents per copy.

Obsolete Engines For Colleges

The first class of obsolete aircraft engines in educational institutions for aeronautical purposes have been made to the Universities of Michigan, Louisville, N. Y., and in the Worcester Polytechnic Institute, Worcester, Mass. This was done under the Act of Feb. 24 which provided that the Secretary of the Navy should furnish to each of the three universities, free of charge, one aircraft engine, suitable for use in aeronautical courses, any aircraft, aircraft parts, instruments, or engines which had been declared surplus by the Navy Department. It further provided that such aircraft, aircraft parts and engines were not to be used in actual flight.

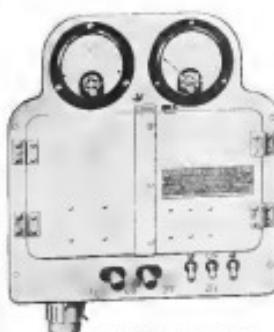
LEECE-NEVILLE GENERATORS



15 VOLT — 15 AMPERE GENERATOR
TYPE E-1



15 VOLT — 30 AMPERE GENERATOR
TYPE E-2



GENERATOR VOLTAGE CONTROLLER
TYPE AMB-2



GENERATOR VOLTAGE CONTROLLER
TYPE E-3

Lee-Neville Voltage Regulated Generators for aeroplanes are designed to operate at 15 volts in capacities of 15 amperes, 25 amperes and 30 amperes.

Lee-Neville Voltage Regulated Generators issue electric current at a steady voltage up to full generation capacity, as well as protection for all instruments, lights and wiring against a sudden increase in voltage due to open circuits.

Lee-Neville Voltage Regulated Generators are in use by United States Army Air Service, United States Navy Air Service, United States Air Mail Service and a number of private operators of aeroplanes in commercial service.

Lee-Neville Voltage Regulated Generators can also be operated with or without a storage battery.

LEECE-NEVILLE COMPANY **Cleveland, Ohio**

Lieutenant Callaway Sets New Speed Record

Lieut E. W. Callaway, flying at Hampton Roads on April 23, established a new World speed record for seaplanes, carrying a load of 1,200 lb. He attained an average speed of 162.4 mi. per hr., or 161 mi. (100 km.) per hr.

The records are being forwarded to the F.A.I. for confirmation and comparison with the record made at St. Raphael, France, May 14, 1926, by Lieutenant Daugardet, who flew at a speed of 168.269 mph.

Lieutenant Callaway took off from the Naval Air Station at Hampton Roads, at 2:39 p.m., in a new Wright Gasser (Pope & Whitten Wasp engine) and flew the triangular course of 800 mi. in 10 min., 17 sec. The plane used was the one which Lieutenant George H. Hendrick broke the World's altitude record for seaplanes with 560 ft. load on April 25.

Lieutenant Callaway was born at Somersett, N. D., March 18, 1895, and became a pilot in the U. S. Navy in 1917. He is now stationed at the Anacostia Naval Air Station and is a member of the Navy test staff there.

New German Lightplanes

The German engineer Riedelius, of Cassel, Germany, has recently constructed a small lightplane with a monoplane wing. On trial, the engine is said to have given 225 mi. from Cassel to Berlin in 26 hr., consuming only \$1.20 worth of gasoline. (Whether this indicates about 8 gal. of gasoline, assuming the rate in the United States, or a little under 3 gal., assuming the approximate cost of gasoline abroad, is not clear—Ed.)

A further report says that a four-seater Messerschmitt B. lightplane has a maximum speed of approximately five 721 ft. and in 1 hr., 56 min., and reached an altitude of 14,630 ft. The company which manufactured this machine is now specializing in a 20-lug plane with an Albatros engine, which should sell for about \$8,300. The machine will have a span of about 34 ft. and a length overall of 17 ft.

Dutch Trans-Atlantic Flight

A trans-Atlantic flight, under the impetus of the Royal Dutch Air Force, is being contemplated. If undertaken, the route would be from Holland to Canada by way of Iceland, Greenland and Vancouver.



2 *S. A. Price*
American Olympic winner is on the Wright Gasser (Pope & Whitten Wasp engine) that breaking the World speed record for seaplanes carrying a load of 1,200 lb. average. His speed was 162.4 mph.

Chancie Aero Club

The Chancie Aero Club, of Chancie, Kan., was recently organized to advance aviation activities in that city. At present there are seven members and several more are on the application list. The club meetings are two weekly, a Saturday and a Sunday, and the meetings are held in the hall, the owners of which gave the charter. A dinner is held monthly on the field, which is a quarter section, one mile west and a half a mile south of Chancie. A gasoline pump and a field marker are to be installed soon and one or two field managers will be on duty at the field at all times.

A young option played havoc with the planes on the field Sunday night, April 18. The hangar framework was burned, falling on the Standard, and burning one wheel. A Standard was flying over the field and landed in a telephone wire, almost destroying the fuselage and a Standard wing broke into the road, causing slight damage.

Student training, passenger hauling and advertising are the chief occupations of the local pilots.

Holland Stamps on Air Mail

Pursuant to the request of the Postal Administration of the Netherlands, commencing at once, only Netherlands postage stamps will be recognized in payment of the fees required for onward transmission by the United States Air Mail Service of letters mailed in the Netherlands.

Sites Offered for New York Airport

As a result of a campaign started several weeks ago by the Committee on Air Landing Places, of the New York Board of Trade and Transportation, ten offers have been submitted for sites for an airport. The landing places listed are:

The property between Baychester Avenue and the Bronx River, south and south of East 2222 Street; a site on the Bronx Point section of the Bronx, between East River, Long Island Sound and the Bronx River, the Empire City Race Track at Yonkers; two sites of an average of 268 and 98 acres each, lying east of Grand Central, L. I.

Archibald Speer, chairman of the committee, has announced that a thorough investigation of all the sites and suggestions will be made before a decision is made.



TWO "HOFFMANN" Precision Roller Bearings on the shaft of the Wright "Whirlwind" Engine, carried the load of the Bellanca Plane in its record-breaking non-stop flight of 51 hours and 12 minutes.

I be most costly itself may de-

...nere the ultimate in de-

service is the one criterion—in such cases, "HOFFMANN" Load-ability, Shock-ability and Speed-ability are the safety factors employed by engineers and manufacturers in increasing numbers.



And, where dependability is just as essential, but the loads are moderate and steady, truer even speed

"NORMA"
PRECISION
BALL BEARINGS

In both open and closed types, in the range of sizes leading up logically to the heavier duty for which "HOFFMANNS" are so well adapted. Catalog 903

The design and construction which give the "HOFFMANN" its pre-eminence are fully described in Catalog 904. And the standard types, uses and ranges are given in Catalog 915.

Both will be sent at your request.

NORMA-HOFFMANN BEARINGS CORPORATION
STAMFORD, CONN. U. S. A.

50-42

"HOFFMANN"
PRECISION
ROLLER BEARINGS

National Air Tour to Start June 4

The first national air tour is announced to have 2,000 airports, towns, cities, etc., that will be the third tour for the *Air Tour*.

Although final determination as to the line of flight and cities to be visited has not been made at the time of going to press, it is planned by the tour committee to make the flight at about two weeks duration covering some twenty states. At each of the twenty stopping places, public demonstrations are planned with a view toward making public opinion in all transportation centers to extend the scope of commercial and passenger interests in the establishment of airtour airports.

In addition to the airtour planes and airports the participants, an airtour program of rechartered and reorganized has been planned for each stop-over. Transportation facilities from leading hotels in hotels, local accommodations, all meals, etc., will be supplied by the tour management and cooperating committees throughout the tour.

The tour is arranged to permit passengers and pilots to compete for the *Edsel Ford Trophy*. Sheet trophy and monetary prizes, in addition to the regular prizes of \$500 to each entrant competing the tour will also be awarded. The *Edsel Ford Trophy*, donated to promote interest in commercial aviation and which is held by the winner for a period of one year until the next consecutive year, will be awarded on points. Another trophy to be awarded for the fastest elapsed time made by planes of 60 cu. m. engine displacement or under, will be presented by the *Studebaker Corporation*.

Sponsoring the Detroit Air Board, Detroit Aviation Department, Detroit Aircraft Club, Detroit Board of Commerce, and the Detroit Flying Club, the National Air Tour of 1927 has the official sanction of the National Aeronautic Association and will be under the supervision of the United States Department of Commerce.

Any manufacturer or pilot interested in taking part or desiring further information is invited to write the tour manager, Bay Colony, Detroit Board of Commerce, Board of Commerce Rd., Detroit.

New Gas Cell Fabric

For a number of years, earlier aviated from the Navy Department, the problem of obtaining a new type of gas cell fabric has been under investigation at the Bureau of Standards. During the past year this problem has shown great promise of approaching final solution. At the present time goldbeater's skin fabric is used to retain the buoyant gas within the gas cells. This fabric is too brittle to withstand Lester's claim. Only by the use of one of the esterates of the oil on reinforced fabrics. The fabric is made in weight, durability, and has low permeability to the heavier gases, hydrocarbons and helium, and to the chief gases of the atmosphere. The manufacture of a set of such cells, however, is a very expensive process, costing as much as \$1,000 per set, but has been completed. Thus, for example, the sets of three which were recently received the total value of half million goldbeater's skins. Furthermore, with the continued development of the Zeppelin type of airtank, since the supply of goldbeater's skins is necessarily limited, it will become more and more essential to replace this fabric with some other type.

As the result of an extended investigation the Bureau has developed a fabric which promises to displace goldbeater's skin in the manufacture of gas cells. The new fabric is lighter and of lower permeability than the goldbeater's skin fabric. The new materials are available in sufficient quantities and so the roofing can be applied as a continuous film. In a similar process, the finished fabric is much uniform than the goldbeater's skin fabric and can be made at a relatively low cost. At the maximum, a complete cell made of the new fabric should not cost less than \$100 as much as a similar unit made of goldbeater's skin fabric. Furthermore, the methods of manufacture are improved and simplified and so greater qualities of the fabric are required even the

present cost of manufacture can be reduced materially. However, using the present high estimate of production costs there can be节约 in the manufacture of the gas cells for the two new models proposed by Congress a saving of approximately one million dollars, or one-eighth of the total estimated cost of these ships.

The preparation of the fabric has passed the laboratory stage and samples have been made successfully on a factory scale. The manufacture of a full-size experimental gas cell for installation in the Los Angeles is now under way.

Record Delivery to Philadelphia Airport

Among the interesting arrivals reported by the *Lindbergh Philadelphian Flying Service* at the Philadelphia Airport was one of the three place monoplanes built by the *Span Aeroplane Co.* of San Diego, California. It is the first of this type to make its appearance in the East and its general problem is to be solved rapidly for a long distance delivery to a commercial or pleasure customer. The plane was piloted by Mr. H. G. of the *Pan American Air Transport*, who reported 86 hr 18 min. travel flying time from San Diego and it is interesting to note that the plane came through the recent flood devastated area where over railroad transportation has been suspended.

The plane was delivered to Charles McFadden, president banker of Philadelphia, who will use it exclusively for his own convenience and pleasure.

Second Cairo-Capetown Flight

The British Royal Air Force is carrying out another flight from Cairo to Capetown, similar to one made last year, when four Fairey III B planes were used. Four Fairey III F machines are engaged on the present flight, the purpose of which is to investigate flying conditions through Africa.



LOS ANGELES MAKES THIRD FLIGHT OF THREE
The Los Angeles made its third flight of three on April 29, 1927, from San Diego to Los Angeles, Calif., at 11:30 a.m. The number increased over Adelton, Mo., Long Beach and Anthony Park and arrived over the *Los Angeles Times* building at 12:15 p.m. The flight took 86 hours and 18 minutes. The plane is to go to Europe during the week of April 30, the day after its departure and back

FOR THE NATIONAL GUARD**THE NEW CURTISS "FALCON"**

A recent contract awarded by the Government will make available, this year, a quantity of Curtiss "Falcons" equipped with the Liberty motor, for use by the National Guard.

The "Falcon" has the highest performance of any two-seater military airplane in service today. Having thoroughly established its superiority by service tests extending over the past two years, it is now being purchased in large quantities as the standard service observation and attack plane of the Air Corps.

The equipment of the National Guard with the "Falcon" is in accordance with the far-sighted policy of the government in providing all branches of the service with the most modern of aircraft material.

THE CURTISS AEROPLANE

Offices:
GARDEN CITY, N. Y.

Curtiss & MOTOR COMPANY, INC.
Factories:
GARDEN CITY & BUFFALO, N. Y.

The Close of a Great Achievement

Conclusion of the Pan-American Flight of the Air Corps Loening Amphibians Marks Outstanding Flying Event of Year

WITH THE arrival of the four Loening Amphibians which arrived in the Air Corps Pan-American Good Will Flight from Brazil, Jan. 13, from France, the Air Corps and the New York at Bolling Field, on May 2, this outstanding 18,500 mile flight will come to an end. Starting from Kelly Field, San Antonio, Tex., on Dec. 21, Major Durang, commanding officer of the flight, and his companions visited most of the principal cities of Central and South America.

Many Notable Heats

The flight was undertaken with the purpose of securing experience over country flying experience for the Air Corps personnel and also to strengthen the friendly relations already existing between the Latin American countries and the United States. In addition to above mentioned, many other flights were made.

The flight covered 150 land stages, flying in places where airplanes had never before been seen. The first flight even attempted down the entire western coast of South America by crossing the Andes at an altitude of 12,000 ft. It was one of the achievements of the Pan-American flight. In this latter stage of the flight the 450 miles were covered without stop, in 3 hr. 45 min. On another section of the 4,200 American air miles were covered in 10 hours, 40 minutes, 15 minutes being spent in one day. The longest non-stop flight of the trip, a distance of over 500 miles, was made from Rio de Janeiro to Maracaibo, Brazil.

Flying took place on all kinds of weather. At one time, when the squadron was over the Amazon, it flew in close formation through a heavy rain-storm a few feet above water, because of lack of visibility. Furthermore, the planes were at 5000 ft. to 6000 ft. above the ground, directly opposite to clouds found near sea level.

The flight has demonstrated the practicability of travel by plane in South and Central America; invasion was indeed unavoidable. Major Durang regards the flight as high in human interest and full of the thrilliest possible moments for the people and Government of any country in the Central and South American. He has reported that several valuable technical experiences had been gained which were important points regarding the employment of amphibious experiences, such as the tools of the amphibians, as soft water.

The various stops and landing dates on the flight are as follows: Puerto Beliz, Tex., Dec. 22; Tampico, Mex., Dec. 23; two places of Veracruz, Mex., Dec. 27 and the remaining

three Dec. 29; Manzanillo, and Salina Cruz, Mex., Jan. 14; Guatemala City, Jan. 15; Bogota, Colombia, Jan. 16; two places at Puerto Viejo, Panama, Jan. 17 and three at Mancave, Nicaragua, Jan. 18; 12 places at Puerto Viejo, Costa Rica, Nicoya, Panama, Jan. 19; 12 places at Puerto Viejo, the others three at Barranquilla, Colombia, Jan. 20; Cartagena, Jan. 21; Guayaquil, Ecuador, Feb. 1; Pichincha, Peru, Feb. 2; Lima, Peru, Feb. 4; Potosi, Bolivia, Feb. 5; La Paz, Bolivia, Feb. 6; Montevideo, Uruguay, Feb. 7; Rio Grande do Sul, Brazil, March 1; Pernambuco, Brazil, March 2; Rio de Janeiro, Brazil, March 3; Santos, Brazil, March 4; Salvador, Bahia, Brazil, March 5; Salvador, Bahia, Brazil, March 6; Santos, Brazil, March 7; Fernando de Noronha, Brazil, March 8; Rio de Janeiro, Brazil, March 9; Pernambuco and Paraíba, Brazil, March 10; Recife, Brazil, March 11; Pernambuco and Paraíba, Brazil, March 12; Pernambuco and Paraíba, Brazil, March 13; Recife, Brazil, March 14; Pernambuco and Paraíba, Brazil, March 15; Recife, Brazil, March 16; Pernambuco and Paraíba, Brazil, March 17; Recife, Brazil, March 18; Pernambuco and Paraíba, Brazil, March 19; Recife, Brazil, March 20; Pernambuco and Paraíba, Brazil, March 21; Recife, Brazil, March 22; Pernambuco and Paraíba, Brazil, March 23; Recife, Brazil, March 24; Pernambuco and Paraíba, Brazil, March 25; Recife, Brazil, March 26; Pernambuco and Paraíba, Brazil, March 27; Recife, Brazil, March 28; Pernambuco and Paraíba, Brazil, March 29; Recife, Brazil, March 30; Pernambuco and Paraíba, Brazil, March 31; Recife, Brazil, April 1. An additional mention, with the two pilots who had been added to their plane in the arrival at Buenos Aires joined the remaining three at Puerto Cabello, Venezuela.

A Most Responsible Mission

In looking back over the memory of the Pan-American flight, it is impossible to be anything but impressed by the manner in which both pilots and planes sailed through so various severe miseries for which they started out. The "Inca," no doubt consciousness of the nature of the venture undertaken, once remarked the step-by-step flight news to the readers of the daily papers. Nevertheless, these four fliers have been the pride of the most glorious and responsible wireless of the Air Corps.

Gaining experience in the execution of service flights over long distances with the minimum of ground assistance; an interesting expression of their can is air milestones over

[Continued on page 932]



The photo captures Captain Durang standing next to the Loening Amphibian aircraft, which reached the final destination of the Pan-American flight. The aircraft is shown in its natural environment, possibly a field or airfield, with its unique design and large engine cowling clearly visible.



They used

AMOCO PRODUCTS

through the whole flight

THE Pan-American Good Will Flight was a triumph for AMOCO Products as well as for the men and airplanes.

AMOCO-GAS (Aviation Grade) and AMOCO Motor Oil were used throughout the whole flight from Kelly Field to Bolling Field by way of the Argentine.

AMOCO Products were shipped to seventy points in South and Central America and the West Indies, so that the Army Aviators would find fuel and oil of the highest quality available wherever they landed.

The completion of the Pan-American Flight marks an important step in the progress of American aviation — an achievement in which AMOCO Products played an important part.

We congratulate the Army Fliers on their courage, their skill and their success. And on the good judgment which led them to use AMOCO-GAS (Aviation Grade) and AMOCO Motor Oil exclusively!

AMOCO-GAS



AMOCO MOTOR OIL

THE AMERICAN OIL COMPANY

AMERICAN PETROLEUM & TRANSPORT CORPORATION
Baltimore, Maryland

Doctor Ames: Chairman of The N.A.C.A.

*Eminent John Hopkins Professor to Succeed the Late Charles D. Walcott
As Chairman of National Advisory Committee for Aeronautics*

DR. JOSEPH S. AMES, of Baltimore, was on April 16, selected Chairman to succeed the late Dr. Charles D. Walcott, who died on Feb. 9, 1937. Along with Doctor Walcott, Doctor Ames was appointed by President Wilson in 1915, as one of the original twelve members of the Committee and has served continuously and faithfully ever since. He has been chairman of its Executive Committee for twelve years and Chairman of the Executive Committee since 1918.

The committee was the instrumental meeting of the entrepreneurship of the National Advisory Committee for Aeronautics at which the following were present: Dr. Joseph S. Ames; Dr. George K. Burgess; Dr. William F. Durand; Brig. Gen. William E. O'Flaherty, U. S. A.; Capt. H. S. Ladd, U.S.N.; Prof. Charles P. Munn; Major Adm. W. A. Moffett, U.S.N.; Dr. W. E. Glavin; Mr. Prouty; U.S.A.F.; Dr. David W. Taylor; and Captain Wright.

Dr. Ames had just made his report as Chairman of the Executive Committee in which he described progress in associated research and outlined plans for the future, when the question of "What the ramsey named by Doctor Walcott's death was taken up and his obituary was unanimous."

Doctor Ames was born in New Haven, Conn., in 1865. He received his A.B. degree from Yale University in 1886 and his Ph.D. degree in 1890. After studying abroad, he was emeritus Assistant Professor of Physics at Johns Hopkins University and has been Professor of Physics since 1898. He became Director of the Physical Laboratory in 1905 and was recently given the additional duty of President of the University.

The Close of a Great Achievement

Continued from page 930

both land and water; proving the unsurpassed qualities of what is with little doubt one of the most outstanding airplane designs ever produced, and last but not least land, helping to further the already high status with which the United States stands in the field of aerial navigation. The crew of the Major Douglas and his companions—Capt. Arthur D. MacDaniel, Capt. Jim G. Blake, the late Capt. Clinton F. Wherry, the late Lieut. Tom S. Rankin, Lieut. Ernest G. Whittemore, Capt. Charles M. Robinson, Elmer Marz F. French, Lieut. Bernard S. Thompson and Capt. Leonard D. Wellford, have brought to a successful close one of the greatest flights in the history of modern aeronautics.

Change Chicago-Minneapolis Schedule

The Second Assistant Postmaster General, W. Irving Glavis, has just announced a change in the flying schedule over the air mail routes made between Chicago and Minneapolis, Minn. The change will result in a later closing hour of mail pouches made up at the Twin Cities, Minneapolis and St. Paul. Effective April 30, 1937.

Air Mail pouches may be sent between Chicago 4:50 a. m. to La Crosse 9:30 a. m. from St. Paul 10:00 a. m. across Minneapolis 11:00 a. m.

Leave Minneapolis 12:00 p. m., leave St. Paul 2:45 p. m., leave La Crosse 4:00 p. m., leave Milwaukee 5:35 p. m., across Chicago 7:30 p. m.

Frequency: Daily except Sunday and Monday westbound; daily except Saturday and Sunday eastbound.

Doctor Ames is one of the foremost physicists in America and so far has been elected a member of the National Academy of Sciences in 1909 for "outstanding work in physics." He served for three years as member of the Council of the Academy and was one of the first members of the National Research Council when it was organized in the Academy in 1917. He was president of the First International Congress of the National Research Council which visited France and England in May and June of 1917 to study the organization and development of scientific activities in connection with war-time. He is at present serving also as a member of the Executive Board of the National Research Council and in chairman of its Division of Physical Sciences. He is a member of the Publishing Board of the Research Council for physics, chemistry, and mathematics, and of the American Physical Society, and a member of the American Geophysical Union, a member of the American Section of the International Union of Scientific Radio Telegraphy, and a number of other local and foreign scientific societies. He is the author of a number of articles and books relating to physics, electricity, and magnetism.

For the past eight years he has been Chairman of the Committee on Aeronautics of the National Advisory Committee for Aeronautics and in this capacity has directed the preparation of research programs for the air service of the Army and Navy, the Langley Memorial Aeronomical Laboratory, and the Bureau of Standards, and has effected a general coordination of effort among the governmental and private agencies concerned with the scientific study of various aspects of the fundamental problems of flight.

The Luftthansa Gained During 1936

The flying operations of the German air transport company, Luftthansa, for 1936, show an increase of twenty-four per cent in mileage flown, over 1935. In the latter year the company's planes flew 8,073,750 miles, while in 1936 they covered 10,341,113 miles. However, during the first quarter of 1936, operations of that company were suspended so that the period covered in the only nine months, against twelve months in 1935, July and August were, against twelve months in 1936, January through September, inclusive. The distance flown in 1936, however, was 1,267,363 miles and during the latter slightly more than this figure.

Lufthansa reported an increase of 83.3 per cent in passenger traffic, about 111,000 per cent in freight and baggage and 88.4 per cent in postal traffic over 1935. Attention has been called to the fact that the night route from Berlin to Kasselberg had a specially heavy postage patronage, a total of 4,480 lbs. of matter being transported over the night route from May 1 to Sept. 30. The regularity of performances is given as 97.5%.

On Oct. 15 the Lufthansa began regular Berlin-Kasselberg, which reduced the operating time by 50% per cent. The Wiesbaden route adds to the five main routes, as compared with fifteen on the former schedule, and twenty-three intermediate points, against fifty-seven covered during the summer season.

Daily Service Between Pittsburgh & Cleveland

The frequency of service on C. A. M. No. 11, Cleveland, Ohio, via Indianapolis, to McKeesport and Pittsburgh, Pa., effective April 21, 1937, has been changed to daily, instead of daily, except Sunday.

Again Pennzoil helps set a new world mark



Photograph from Roosevelt Field, Long Island, N. Y., shows Pennzoil being put in marine propellers to record breaking flight.

"It's the best oil I ever saw coming out of a plane after a long flight"

G. M. BELLANCA,
designer of record-making plane.

A COSTA and Chamberlin
trusted to Pennzoil—100% supreme Pennsylvania quality—in the record-amazing endurance flight of 51 hours, 11 minutes, 20 seconds that ended April 15 at Roosevelt Field.

4080 miles with a motor that never missed a beat! 4080 miles with only 4 and thirty-one hundredths gallons of Pennzoil consumed.

Pennzoil also lubricated the plane of Lieutenants Kelly and MacReady, who held the previous American record for sustained flight.

It made possible many other record performances in the air. There is no better oil than Pennzoil. There can be no better oil than Pennzoil.

THE PENNZOIL COMPANY
Oil City • Bradford • Los Angeles • San Francisco
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PENNZOIL
100% PA. QUALITY
PENNSYLVANIA OILS

PAYNE EXPORT AND IMPORT CO., 113 BROADWAY, NEW YORK CITY
Foreign Distributors of Pennzoil, a PCCP Product



The Vought Corsair on a catapult (Pratt & Whitney Wing)

The Vought Corsair Naval Airplane

A Two-Place Convertible Observation-Fighter with Single Seater Characteristics and Performance

THE VOUGHT Corsair (Navy designation Model GFC-1), a high performance two-place observation-fighter, is a development of the Vought Corsair, which was originally designed as a float-type landing plane. The plane will be used as an airplane for the present Vought UO's non-mission-carrying naval missions for the U. S. Navy.

The Corsair is a tricycle airplane, powered with the Pratt & Whitney Wasp 480 hp. radial air-cooled engine. It was designed by the Vought Corporation, engineers having operated it well in the States at Anacortes, and in the first place left to meet the latest requirements of the U. S. Naval Air Service for two-place observation and reconnaissance aircraft.

Some measure of the versatility of the Corsair is readily obtained from mention of its wide range of service capabilities including regular high-speed reconnaissance work at both land and seaplane, observation, searchlight, bombing, and general emergency work. In other services, it may be ordered either as a lightplane or as a seaplane from the same original and basic parts, and is further equipped to take off from land or the aircraft carrier.

The first four of the Corsair were made at Middletown, Rhode Island, November 12, 1936, and since that time the plane has been given through most exhaustive tests by the Navy Department's official Trial Board, first as a two-seater, then as a single-seater, and then extrapolated. In these official tests, with full load and with equipment and armament in place, the Corsair showed

claims, credits and performance comparable to service seaplanes, although it is at lower gross flying weight and maximum fuel load.

The Navy Department has withheld publication of the actual performance data on the Corsair, but the top speed may be used to satisfactorily exceed 200 ft. per second between types, and to approach that of current single-engine pursuit types. The demonstrated low speed was much lower than speed of sound.

The official full load claim in ten minutes amounts to 9 percent standard oxygenator pressure tires, and equals that of the recent experimental single-engine fighters. The speed range, the action of high to low speed, is particularly noteworthy, and at the order of 200, obtained under general load, over all conditions.

Perhaps the most interesting phase of the Corsair's performance is its unusual ability to carry and out-distance present service fighters in the performance types of both altitude and level. It will not fall out of sight and out of control at service ceiling and its inverse ceiling, as a seaplane, is used to exceed that of most single-engine fighters in landplanes.

The performance of the Corsair is all the more interesting when the limitations which are imposed by use of seaplanes aboard the Navy's carriers are understood. Such a plane cannot exceed certain definite overall dimension and gross flight weight, if it must have an extremely low, safe, minimum flying speed to take care of adverse conditions of catapult



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Waiting for the Wright comes of the Wright Cessna.

machining, and used every the maximum possible load with the highest possible performance. All quick assembly and disassembly with rapid conversion from land to seaplane is necessary, requiring compactness and simplicity in the entire structure. Robustness and strength are essential since the planes are exposed to all conditions of weather and use.

The engine, water-cooled is made up of a special Wright tank and a double cylinder section for the upper wing, and a double cylinder section for the lower wing. The entire gasoline, forward struts with empennage in the upper wing. The rear struts give at all times support and stability whatever the position of the tail sections, and function in unceasingly steady gear position resulting in much greater security of the float both fixed and free flying.

Easy to Control
With the Cessna is particularly stable in flight, the plane flies and maneuveres at the touch of a finger. It goes very rapidly and easily when put into a turn, yet it will not "flat-spin", nor has it any "stall-tumble" tendency.

In a properly designed airplane of this type, the use of French or Pander type floats is often preferred over internal floats, and were definitely shown by this new Wright biplane to be neither necessary nor desirable.

The Wing Arrangement and the division of the cockpit area naturally good visibility, provide the best possible visibility for all purposes and with maximum area of lift for the front man. Reasonably good downward and land low vision is possible from the rear cockpit, that is, maneuvering and "scanning" are greatly facilitated and accuracy is obviated.



THE CORRUGATE NOSE. The fine range, carry and nose coating of the front & wing. Note detail, as well as the economy of leading mechanisms is clearly shown.

not exceed. The pilot can safely see the leading gear wheels and axle, if additional vision is desired for deck landings, however, the pilot's seat is provided with an automatic height adjusting device, making it possible conveniently to adjust the seat in the air while soaring in for a landing.

The wings are of standard Wright construction, built up with spruce beams (except in center section where steel beams are used), and ribs of plywood and spruce with Warren-truss stiffeners. The wing panels are fabric covered, and finished with Perry-Ashman painted dope.

The tail surfaces consist of single giving preference to all speeds, ease in landing. The tail surfaces are of welded steel tube construction, fabric covered like the wing panels, with powdered dope finish. The horizontal stabilizer is adjustable in height by a screw jack, which controls the pilot's cockpit.

The Cockpit
The comfort of the crew has been given special attention. Both seats are comfortably long and roomy, allowing unusual leg-room and comfort for both occupants. Cockpits are windproof and fitted with adjustable, non-shattering glass windows. Ingress and egress from both cockpits is remarkably easy, even when wearing a passable. In addition to the adjustable seat noted above, the rubber bar in the pilot's cockpit is also adjustable for the comfort and convenience of different pilots. The rear seat may be folded out of the

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is entitled to the benefits granted by law in the production of airplanes manufactured in accordance with an approved plan of type, materials, methods, assembly, and workmanship with the authorized quantities, descriptions and drawings on file in the office of the Secretary of Commerce. Authorization shall be discontinued and made a nullity,

The type of airplane for which this certificate is issued is known

as _____, Serial No. _____

Dated _____, 1926, U.S. 1927

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Undercarriage detail of the Wright biplane showing the three-passenger cockpit, developed by Vickers with the license received.

wry, and with the removable rear stock and arrangement of seats, gives an undistracted general's cockpit for the operation of the fire guns. The fuselage will housing storage compartments as both sides of the rear cockpit for the convenient location of operating and special equipment, leaving the side pit under free projection which might foul a parachute. This feature is not possible, of course, in all-sided biplanes like the Fokker.

The fuselage is of the tandem cockpit arrangement, entirely strengthened to reduce颤动. The fuselage frame



The Wright biplane as a land plane (Pratt & Whitney Wasp engine).

is fabricated of chrome-molybdate steel tubing, welded to girders, with prior "bellow strength" strengthening built into all stressed parts. Allowing for a slight clearance on the fuselage from the rear cockpit forward, and fabric covering over the front transom off. Provision has been made for an auxiliary air engine cooling by means of suitable dispensers in the engine cowling. Ample access doors are provided throughout the fuselage to permit easy maintenance of operating parts, and wheel wells of the fuselage are quickly detachable for complete separation of sections which do not require any tool or even being lowered.

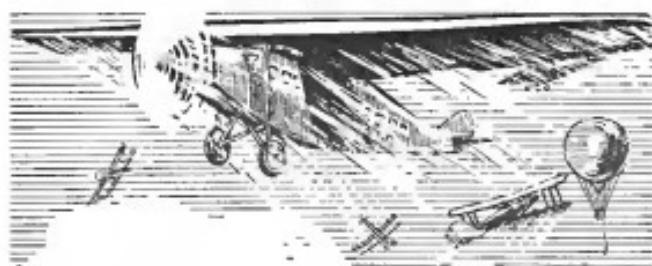
A single open cockpit is provided in the rear section except for storage of last along the raffia, etc. Storage for luggage is provided under the seat in the rear cockpit.

The Pratt & Whitney Wasp engine is mounted on a very simple engine mount built up of welded steel tubing and a pinned ring plate. All take-offs are reinforced and strengthened, and the mounting is designed with all welds in shear. The mount construction remains relatively as simple, and the mount is quickly detachable by the removal of only four taper studs and nuts.

The engine used in this latest Wright model is of the two-bladed all-metal type and was manufactured for the Navy Department by the Standard Steel Propeller Company of Pittsburgh, Pa.

The fuel tanks are of the familiar Wright tank type, fitting into the sides of the fuselage framing, but in the case of the Cimar both tanks are duplicate and interchangeable as important advantage when considering spare parts problems. The tanks are of unusually large capacity while, with the exception of the Wasp engine, give a longer range of flying radius and enable it to perform for long cross-country flights as well as localised reconnaissance work at sea. The oil tank is mounted behind the engine compartment floor well. All tanks are fitted with large diameter filter units with special filter caps, making it possible to refuel the Cimar very quickly. The fuel and oil systems can be completely drained, as suitable drain cocks and plugs are located at the lowest points in the respective systems.

The Cimar wheel-type landing gear is of the permanent type and the shock absorber is a single unit located in the front. An oil-shock absorber is also located in the rear. The air reducing device, Overhous 25 in. x 6 in. whisks and tires are used and the wheels are enclosed in spun metal



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Vought Planes Added To Coast Guard Service

Vought Type UD-4 Well Suited to Coast Guard Service. Planes Equipped with Gams and Radio.

LIVELY PREPARATIONS are reported at the various U. S. Coast Guard bases along the Atlantic coast for the annual flying offensives against Rum Runners. The recently acquired Vought model UD seaplanes, designed and built by the Chance Vought Corporation, especially designed and equipped for this special type of work, were among the invited aircraft purchased directly by the U. S. Coast Guard under its own first Air Service appropriations.

Several years ago, as a try-out to ascertain the possibilities of off-shore seaplane patrol against rum-runners and smuggling, the Coast Guard purchased two Vought 100 single-seat seaplanes from the Navy Department. These became known as Voughts have been in continuous operation for two years, and the results obtained, coupled with the splendid reliability and operating record made by the planes, recommended the Bureau's Departmental efforts of the necessity and economy of developing a suitable site for within the Coast Guard as "trusts" and as the oldest intelligence service, for its seaplane craft patrol.

Planes Especially Equipped

These special Coast Guard planes incorporate many features which are particularly valuable in that difficult service. The Voughts are built of all metal, including propeller, all-plexiglass greater number than in the plane previously employed for that work. Reconning machine guns are also fitted, and the Coast Guard has installed a special long-range radio receiving and recovering set to maintain contact with its surface patrol craft and coastal stations when the planes are many miles at sea or observation missions.

The engine is a Wright Whirlwind J-5, 250 h.p.

A Vought 100 single-seat plane has been obtained by the city of the new Navy N-9 wing section. The seaplanes have been designed with heavier fighter features of safety, instead of the lower factors usually specified for observation seaplanes.

Many changes and modifications in arrangement and accessories are in evidence, the better to adapt the planes to the special needs of the Coast Guard. UD-4s those the usual long-range radio equipment and radio receiver which enable Voughts stand out in any company. The biplane

are beautifully finished, displaying unusually clean lines. The new wing section has many changes leading to increased the speed and range of the planes.

The color scheme is light slate-grey-yellow cannot and purple deck, with black piping and stabilizer, which, with the Coast Guard identification markings or black letters, makes a very striking color combination. This color scheme enables the planes easily distinguishable at sea and distinguishes them from regular Naval seaplanes.

The seaplane problem has been simplified and exceptional airworthiness and extra strength have been provided for the seaplane. The Coast Guard has given the Vought planes the required by the use of standard Vought Navy type anti-pot float gear. This water landing gear consists of a very strong single control door, supporting the airplane by streams line reinforced tubular steel struts and brass tubes, and a pair of stout mounted aluminum floats, one under each lower wing tip.

The seaplane landing gear had been given extensive service tests in the 1929 trials and the Vought planes will be similarly treated by the Coast Guard and it is believed considerably more reliable than any other plane. The landing gear is similar to that of all manner of marine craft, coupled with the ability to take off from, and land in, rougher seas than may other service planes. In addition water operating capability and the high degree of reliability normally possessed in rigorous patrol service by Vought planes, were determining factors in the decision of the Coast Guard to include in its fleet aircraft now used in other naval service appropriations, for the year 1932.

The use of Vought planes in the U. S. Coast Guard will not render difficult planes to the diversified services now being concentrated so successfully on seafaring sturdy, weathered planes, the reliability and serviceability of which are well known to require comment.

The Rome-Munich Air Service

An service between Rome, Milan, Trieste and Munich has been planned and this project is now being negotiated. It is understood that definite arrangements will be made soon and that the Italian Government will be requested to grant a concession for the operation of the service. It is rumored that the Swiss Federal Aviation is considering the project and the concession for the route.



The Coast Guard Vought UD-4 seaplane which is to be used in the annual flying offensive against Rum Runners and Smugglers in the Atlantic coast against coast guard against rum runners. The engine is a Wright J-5 250 h.p. single seat 212 engine.



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FOREIGN AERONAUTICAL NEWS NOTES

By Special Arrangement with the Automotive and Transportation Divisions,
Bureau of Foreign and Domestic Commerce

Cherbourg as Air Station

Negotiations for the use of Cherbourg, France, as a coast station are now proceeding between the French and German governments. It is the intention of the French government, later, to extend the air service between South America and Germany to Cherbourg, so as to link up with the routes of the trans-Atlantic lines. The coast service service between Southampton and Guernsey has been maintained monthly through the winter, and is proposed to continue the service bi-monthly this summer. Trips to Cherbourg are made nonstop from the Woolston Airport, with special permission of the French authorities, in case of emergency or emergency, such as a passenger leaving his ship at Southampton. The service is to be maintained by the German airline of the respective countries, with the value of the services to be determined by the two governments.

Proposed Argentine-European Mail Services

A contract was recently signed between the Argentine Minister of Mines and Telecommunications and the Compania de Transportes Aereos Internacionales, which will provide for the establishment of an air mail service between Talcahuano, Chile, and Buenos Aires. Under the contract the service must be inaugurated by Sept. 1 of the present year. The route to be covered is from Talcahuano, Chile, by airplane, 1,147 mi., estimated to be covered in 15 hr.; Constitucion to Rio La Plata and Santiago, by plane, 1,267 mi., estimated to be covered in 18 hr.; Talcahuano to Rio La Plata by plane, 414 mi., via Valparaiso, Chile, and then across the Straits of Magellan to the Sarmiento Island, by speed boat, 1,204 mi. In three days, Sarmiento Island to Perito Moreno, Argentina, by plane, 490 mi. in 5 hrs.; Perito Moreno to Rio de Janeiro, by plane, 1,200 mi. in 14 hrs.; Rio de Janeiro to Buenos Aires, by plane, 3,000 mi. in 15 hrs. When a through service of 15 hr. days over a total distance of 6,600 mi. is provided, it will be possible to make a return trip to Chile with the consumption of about 5,000 liters and the utilization of planes for passengers in the Cape Verde to the Malvinas Islands area. A weekly service each way is stipulated in the contract.

Chile inauguates Air Mail Service

Chile's first mail service was inaugurated recently for the transportation of foreign postal pieces between the port of Valparaiso and Santiago.

The inauguration is said to be of great importance to business houses in the Chilean capital, for under previous conditions all correspondence from that port for foreign countries had to be mailed the day preceding the mail steamer's departure for Valparaiso. Under the new system, the Chilean steamer can now close the circle and the return of the day on which the mail was sent. A further advantage is that mail from abroad will be distributed in this city a few hours after its departure from the ocean mail carrier.

The news of the beginning of the new service has been received in Chile with the wildest popular approval.

Cross Alps Seventy-five Times

The Vichu-Vierna air line has a totalized regularity basis kept of 95% for the rest of the last four months of 1936. Two of the plain, Peugeot and Hispano, have crossed the Alps seventy-five times.

Civil Aviation Progresses in Canada

Civil aviation in Canada registered a marked increase in 1936, as compared with previous years. Statistics were taken from reports supplied by all aviation organizations in Canada, except the Royal Canadian Air Force and a few current counts by radioactivity.

In 1936, 4,555 flights were made, an average 3,171 in the preceding year. Flying hours increased from 4,068 in 1935 to 5,088 last year, an increase of about 25 per cent. In 1936, 6,000 passengers were carried over 56,715 miles, as compared with 4,000 passengers and 44,640 miles the year before. In 1936, freight traffic increased 12%, to 72,721 lb., as compared with 65,000 lb. in 1935. These figures are approximate, carried by the Provincial Air Service in Northern Ontario.

Annual average statistics photographed 50,021 mi. in 1936 and 53,487 in the previous year. Air patrols totalled 365,000 miles in 1936 in Northern Ontario. Teacher-type mapping by aircraft was done on 11,522 sq. mi.

France-Argentine Air Line

In an interview given at Toulouse recently officials of the French aviation company, Latécoère, stated that they had secured a ten year contract with the dictator of Communications of the Argentine Republic for creation of an aerial transport line with weekly service between Europe and Argentina. Under the terms of the contract the service must begin Sept. 1, 1937, but a trial flight is to be conducted in France the first half of May.

The Latécoère company officials made the following statement: "Beginning Sept. 1, 1937, our line will be in operation between Toulouse and Buenos Aires, making the one-way trip in about nine and a half days. Because of the lack of perfected airplanes, the line will not be entirely served at the start, and the service to the Atlantic and to the island of Madeira (Portugal) will be started first."

"In 1938 a complete aerial service will bring Buenos Aires to within four days of Paris. The technical preparation of the lines is entirely terminated. The route to be followed will be: Toulouse-Carablanche-Dakar-Cape Verde-Madeira-Buenos Aires."

The Comisión de Transportes Aereos Latécoère is reported to have a subsidy from the French Government of \$100,000 for its total operations the first year on several lines which it plans to establish. No subsidy will then be requested from the Argentine Government.

French company claims to have only the use in this service 200 airplanes, many airplanes, also 1,000 tons of equipment, with a speed of 22 miles per hour, and 100 trained pilots. It is noted that this refers to the entire organization of the company which is operating, or planning to operate elsewhere as well.

Australian Air Service

More than 4,000 passengers were carried by the Australian commercial air services during the last fiscal year ended June 30, 1936, with a marked decline. The total ridge down from the year 1935-36, when 5,000 passengers may be necessary of about 500,000 miles over the previous year.

In New South Wales airplanes carried 4,011 passengers; in Victoria 3,205, in Queensland, 905; and in South Australia, 348. In each of the States named, except Queensland, these were accident, resulting damage to the plane.

More than 576,000 letters were carried in 1935-36 by Australian airplanes and 63,000 lb. of freight.

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In a new 40 x 72' shop completely equipped for all plane and motor repair work.

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Wide Vision — Adjustable Bridge — Curved Lens — Very Comfortable

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MARSHALL, MISSOURI
We Will Be Here Tomorrow

AIRPORTS AND AIRWAYS

Bettis Field, Pa.

By Doss Iva Leach

Solicitors of everything from hangars to grass seed, were gathered yesterday at Bettis Field, airport, Pittsburgh, yesterday, to witness the opening of the new asphalt roads, reconstruct Bettis Circle, drainage, irrigation and Spring dredging made at Bettis Field during the last ten days with no preliminary warning.

Among the commissioners was "Slap" Slaten, an old-time pilot, now famous as a hot dog expert and rated aviator, who owned the restaurant concession, and is now erecting a small "car" shop, book reading and rest room, intended "for drivers, flyers, flying girls, as well as the general public." It is a definite center for all aviation.

All preparations have been made to handle the air mail planes. The runways are graded, rolled and the hangars are completed, including a set of offices and dormitories.

Bill Shantz is expected to attend the inaugurations services of the new field with Horaceone "The Green." This type may later carry much of passengers from here.

On the evening of April 21, a banquet was given at the Penn-McKee Hotel to the members of the Cleveland-Yonkers-Pittsburgh Air Mail. The speakers were introduced by William P. MacCready, Jr., Assistant Secretary of Commerce for Aeronautics; Irving W. Hayes, Second Assistant Postmaster General; Congressmen Clyde King, and others.

The personnel of the Cleveland-Yonkers-Pittsburgh Air Mail is as follows: Clifford Bell, of McKeesport, controller;

Arthur J. Lynch, of Youngstown, traffic manager; Marie McLean, of Pittsburgh, chief of operations and pilot; Dewey Storn, of Pittsburgh, pilot and sheet metal man; Kenneth "Gatley," of Pittsburgh, reserve pilot; William Lippard, formerly of McCook Field, chief mechanic of Pittsburgh. Reserve planes will be kept at all stops on the route.

In H. Terrell, piloting a Boeing training plane from Washington, D. C. to Bettis. Work stopped in the main terminal because of inclement weather. Closed until the following morning. Standard portable hangar, 32 by 40 ft. is being erected to house the planes that are now in small temporary hangars, pending the completion of the large ones. The east and west runway is now in use, having been closed for several days to permit the laying of a long gas line.

Louis E. Barnes, from Wilkes Wright Field, with a Douglas biplane loaded with passengers, was delayed two days on account of minor repairs. These were made at the field and he flew to Washington. Eddie Silence, a St. Louis Trotter, landed here the evening of April 18, where he met William P. MacCready, Jr., Assistant Secretary of Commerce for Aeronautics, and then flew to Washington.

The Southern Air Mail, which had its first landing, has been much discussed and is to be used as the model for the other fields in the mid-west. D. Bass Peet, the field manager, graduated from the Faribault class to the master class. He succeeded in selling three times as one afternoon, but was unable to crack up. Thomas Gleason is having his license reinstated.

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As a LANDING FIELD LIGHT it illuminates over 50 acres with a fan of evenly distributed light.

As an EMERGENCY BEACON (with the floodlight lens hinged back) its 30,000,000 candle power beam will penetrate a low lying haze to a greater distance than the standard incandescent revolving beacon.

As a CEILING LIGHT elevate its beam to an angle of 45°.

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MacCready's High Altitude Plane Was Equipped with Belden Wire

THE Left-Over Airplane used by Louis J. MacCready in establishing the American High Altitude Record of 43,000 feet at McCook Field, was equipped with Belden Wire in all low tension electrical circuits.

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DETROIT, MICH., U.S.A.

by the Grand School Department of the League, 20-hour school. He intends to carry passengers as soon as the bill and fare boy are installed.

Local George Tousignant, piloting a Douglas, came in to show the group how a real plane looks, and confidently told the members of the air meet, "Bob" Phillips has been appointed to build another and larger plane, and he has demonstrated his flying ability by making a flight from the Pacific Northwest to the Gulf of California. He beats the time of Barr to reach the destination stage.

Instructor McNamee, from McCaugh Field, came in pushing a B. II on an inspection tour of the National Glider School in Pittsburgh. The spring class of the Leesburg Flying School is presently filled with local residents and all possibilities of the program are being carried out in the best manner. The school has largely closed down, giving close exposures to all manners. Andrew Steiner, one of the students, is building a lightplane named the Elmer Darragh engine.

Moline, Ill.

By W. E. Moore

After a winter in which the flying business was more or less prosperous, Moline Airport has received and crowded at the field on Sundays and some working afternoons again nearly the hundreds, and sometimes thousands. On Sunday, April 3, there were more than 2,000 spectators at the field.

Paul F. Campbell gave a demonstration flight with the Commercial Flying Aeroplane Co., and the passenger-carrying Travel Air completed its first passenger flight.

Campbell gave the place his initial flight and was pleased, he said, with its climbing ability, stability, etc. This machine is not a quantity production, but the makers hope to begin marketing it as soon as possible.

Davenport, Iowa.

By Ralph W. Con

Davenport expects to give front 100's a choice of two landing fields this summer—the Davenport Airport on the northwestern edge of the city, during a general commercial boom, or for a small cell at the Davenport Flying Club at its present site.

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Hawthorne Heights, N. J.

Campbell is said to be going to start an air line between Moline and Chicago in the very near future. He will operate over a week at first, probably, but it is quite likely that the service will become a daily proposition in a year or two.

In order to get to Chicago from Moline by train one has to take a train at 10 o'clock at night, get to the West City Hotel, have a cold supper, go to bed, and then get up at 4:30 a.m. and catch a train to Chicago. In order to return from Chicago one finds that one must 8 o'clock at night and reaches Moline about midnight. Thus two nights are wasted.

With the Travel Air atmosphere, however, one can leave Moline at 6 o'clock in the morning, get breakfast, spend the entire business day in Chicago and return to Moline by 8 p.m. Go to bed at 10 o'clock at night, if he wishes, and one returns home.

The cost will not be prohibitory, and so unless the train service is improved it is quite likely that Ruth Campbell's necessities will take a small kick from the railroad company's profits.

The instruction—Moline, Back Island and Davenport—has something new to offer the aviation world. The Central American Corp. of Davenport has built the first of three planes designed to carry one passenger and the pilot. It is an unusually neat job, weighs 550 lbs. and develops 100 h.p. with a speed of 100 m.p.h.

Campbell gave the place his initial flight and was pleased, he said, with its climbing ability, stability, etc. This machine is not a quantity production, but the makers hope to begin marketing it as soon as possible.

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The pistols are easy to handle and fitted with safety locks. Individual units are made of steel and are supplied with cases which have for a reasonable price and are capable of distances from ten to fifteen miles. The muzzle pressure of the gun varies from about 7,000 for the small sizes up to 15,000 for the larger sizes.

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1/2 inch Gauge	Full Gauge	Small Gauge	Portion
1/2 inch Gauge Pistol, 12 gauge barrel	12 gauge	12 gauge	Portion
1/2 inch Gauge Pistol, 12 gauge chamber	12 gauge	12 gauge	Portion

For Night Use

1/2 inch Gauges, carb or glass or white clay	Portion
1/2 inch Carburetor, carb or carb or white clay	Portion
1/2 inch Carburetor, carb or carb or white clay	Portion
1/2 inch Carburetor, carb or carb or white clay	Portion
1/2 inch Carburetor, carb or carb or white clay	Portion

For Day Use

1/2 inch Carburetor, carb with powder, carb motor oil	Portion
1/2 inch Carburetor, carb with powder, carb motor oil	Portion

For Night Use

1/2 inch Carburetor, carb with powder, carb motor oil	Portion
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FOR SALE: \$250 bags needed. Spring 1936 new plane disappears in the country. Has been down about five hours. Condition mostly like new. Wm. Export, Walnut Grove Company, Belvidere, Iowa.

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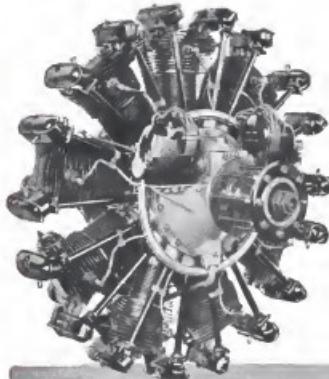
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20 Seconds on April 14th, 1927



A COMMERCIAL engine—in a commercial airplane—flown by commercial pilots—established a new World's Endurance Record! A brilliant tribute to American Commercial Aeronautics.

Both airplane and engine had been used extensively before this flight. The engine—from the standard production line—was

top overhauled at the end of 166 hours, 38 minutes previous service and had had a total of 179 hours and 53 minutes when the Record take-off was made.

During the Record Flight the engine consumed an hourly average of only $7\frac{1}{2}$ gallons of gasoline, and less than 1 pint of oil.

Reliability—Durability—Economy

WRIGHT AERONAUTICAL CORPORATION, Paterson, N. J., U. S. A.